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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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OF COMMERCE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Mar. 31, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on July 12, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,392,257 through 4,393,518
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 27, 1986, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,326,517	06/248,246	4/27/82
4,326,652	06/228,140	4/27/82
4,326,655	06/229,959	4/27/82
4,326,667	06/217,750	4/27/82
4,326,701	06/231,297	4/27/82
4,326,894	06/272,717	4/27/82
4,326,959	06/231,490	4/27/82
4,326,980	06/237,178	4/27/82
4,327,015	06/262,109	4/27/82
4,327,068	06/234,159	4/27/82
4,327,092	06/258,737	4/27/82
4,327,099	06/229,190	4/27/82
4,327,105	06/241,641	4/27/82
4,327,140	06/231,750	4/27/82
4,327,194	06/230,767	4/27/82
4,327,239	06/238,487	4/27/82
4,327,279	06/221,208	4/27/82
4,327,297	06/226,066	4/27/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,383,327, Re. S.N. 863,592, Filed May 14, 1986, Cl. 378/19, RADIOGRAPHIC SYSTEMS EMPLOYING MULTI-LINEAR ARRAYS OR ELECTRONIC RADIATION DETECTORS, Robert A. Kruger, Owner of Record: *University of Utah, Salt Lake City, Utah,* Attorney or Agent: James T. Hoffmann, Ex. Gp.: 256

4,446,846, Re. S.N. 860,668, Filed May 7, 1986, Cl. 126/25R, TABLE TOP GRILL, Linus K. Hahn, Owner of Record: *Columbia Industries, Corp., San Mateo, Calif.,* Attorney or Agent: Karl A. Limbach, et al., Ex. Gp.: 345

4,447,415, Re. S.N. 860,894, Filed May 8, 1986, Cl. 424/101, PLASMA-FREE MEDIUM FOR PLATELET STORAGE, Gail A. Rock, et al., Owner of Record: *Gail A. Rock, a Co-Inventor, Rockcliffe Park, Canada,* Attorney or Agent: Norman H. Stepno, Ex. Gp.: 125

4,504,981, Re. S.N. 863,966, Filed May 16, 1986, Cl. 623/6 INTRAOCULAR LENS, Gerald B. Walman, Owner of Record: *Inventor,* Attorney or Agent: C. Robert von Hellens, et al., Ex. Gp.: 332

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,965,631, Reexam. No. 90/001,015, Requested: May 27, 1986, Cl. 52/232, FIRE RATED GRID-MEMBER WITH CONTROLLED EXPANSION MEANS, Gale Sauer, Owner of Record: *Donn, Inc., Westlake, Ohio,* Attorney or Agent: Pearne, Gordon, et al., Ex. Gp.: 350, Requester: Owner

4,070,586, Reexam. No. 90/001,009, Requested: May 14, 1986, Cl. 307/22, ELECTRIC VACUUM CLEANING AND AGITATOR MOTOR CONTROL SYSTEM, John J. Breslin, Owner of Record: *Beamco, Inc., Mountainview, Calif.,* Attorney or Agent: John K. Uilkema, Ex. Gp.: 210, Requester: Whirlpool Corp., Benton Harbor, Mich.

4,131,716, Reexam. No. 90/001,025, Requested: June 5, 1986, Cl. 428/425, ACRYLIC ACID ESTERS OF POLYTHIODIAKANOLS AND RELATED COMPOUNDS, Eugene R. Bertozzi, Owner of Record: *Morton Thiokol, Inc., Chicago, Ill.,* Attorney or Agent: Gerald K. White, Ex. Gp.: 150, Requester: Owner

4,141,973, Reexam. No. 90/001,013, Requested: May 27, 1986, Cl. 515/54, ULTRAPURE HYALURONIC ACID AND USE THEREOF, E. A. Balaza, Owner of Record: *Biotrics, Inc., Riverdale, N.Y.,* Attorney or Agent: Kenyon & Kenyon, Ex. Gp.: 120, Requester: Roland T. Bryan, Stamford, Conn.

4,346,427, Reexam. No. 90/001,022, Requested: June 2, 1986, Cl. 361/173, CONTROL DEVICE RESPONSIVE TO INFRARED RADIATION, Kitson Blissett, et al., Owner of Record: *Blissett, Dunbar, et al., Swampscott, Mass.,* Attorney or Agent: Gerad F. Dunne, Ex. Gp.: 260, Requester: Owner

4,367,370, Reexam. No. 90/001,028, Requested: June 6, 1986, Cl. 174/48, POWER PANEL SYSTEM WITH SELECTIVE MULTIPLE CIRCUITS, Harold R. Wilson, et al., Owner of Record: *Haworth, Inc., Holland, Mich.,* Attorney or Agent: Flynn, Thiel, et al., Ex. Gp.: 210, Requester: Owner

4,391,949, Reexam. No. 90/001,014, Requested: May 23, 1986, Cl. 325/099, ASSYMETRIC BLOCK COPOLYMERS AND CORRESPONDING ADHESIVE FORMULATIONS, David J. St. Clair, Owner of Record: *Shell Oil Co., Houston, Tex.,* Attorney or Agent: Dean F. Vance, Ex. Gp.: 150, Requester: Goodyear Tire & Rubber Co., Akron, Ohio

4,399,426, Reexam. No. 90/001,019, Requested: May 30, 1986, Cl. 340/347, ON BOARD SELF-CALIBRATION OF ANALOG-TO-DIGITAL AND DIGITAL-TO-ANALOG CONVERTERS, Khen-Sang Tan, Owner of Record: *Texas Instruments, Inc., Dallas, Tex.,* Attorney or Agent: Douglas A. Sorensen, Ex. Gp.: 260, Requester: Owner

4,423,244, Reexam. No. 90/001,017, Requested: May 30, 1986, Cl. 562/466, PROCESS FOR THE PREPARATION OF THE D-2-(6-METHOXY-2-NA PHTHYL)-PROPIONIC ACID, Vincenzo Cannata, et al., Owner of Record: *Alfa Chemicals Italiana S.P.A., Milano, Italy,* Attorney or Agent: Bucknam & Archer, Ex. Gp.: 120, Requester: Syntex (USA), Inc., Palo Alto, Calif.

4,433,070, Reexam. No. 90/001,011, Requested: May 20, 1986, Cl. 523/171, CULTURED ONYX PRODUCTS AND METHODS THEREOF, Gilbert B. Ross, et al., Owner of Record: *Contempart Originals, Inc., Burbank, Calif.,* Attorney or Agent: Wagner & Bachand,

Ex. Gp.: 150, Requester: U.S. Steel Corp., Pittsburgh, Pa.

4,439,442, Reexam. No. 90/001,023, Requested: June 2, 1986, Cl. 424/285, NAFTIDROFURYL CITRATE AND THERAPEUTIC APPLICATIONS, Jacques A. Chick, et al., Owner of Record: *Sanofi, Toulouse, France,* Attorney or Agent: Weiser, Stapher, et al., Ex. Gp.: 120, Requester: Lipha Lyonnaise Industrielle Pharmaceutique, c/o Browdy & Neimark, Washington, D.C.

4,444,953, Reexam. No. 90/001,018, Requested: May 30, 1986, Cl. 525/98, ASSYMETRIC BLOCK COPOLYMERS AND CORRESPONDING ADHESIVE FORMULATIONS, David J. St. Clair, Owner of Record: *Shell Oil Co., Houston, Tex.,* Attorney or Agent: Peter A. Bielinski, Ex. Gp.: 150, Requester: Goodyear Tire & Rubber Co., Akron, Ohio

4,462,708, Reexam. No. 90/001,029, Requested: June 6, 1986, Cl. 400/304, AUTOMATED TAPE LETTERING MACHINE, Cleto R. Luartes, et al., Owner of Record: *Kroy Industries, Scottsdale, Ariz.,* Attorney or Agent: Dorsey & Whitney, Ex. Gp.: 330, Requester: Varitronic Systems, Inc., Minneapolis, Minn.

4,492,389, Reexam. No. 90/001,010, Requested: May 19, 1986, Cl. 280/704, HIGH-LIFT HYDRAULIC AXLE, Gordon F. Wyatt, et al., Owner of Record: *Inventors, Isanti, Minn.,* Attorney or Agent: Haugen & Nikolai, Ex. Gp.: 310, Requester: McNeilus Truck & Mfg., and Wyatt Bros. Ready Mix, Inc., Minneapolis, Minn.

4,499,193, Reexam. No. 90/001,026, Requested: June 10, 1986, Cl. 501/98, PROCESS FOR PRODUCING BETA-SILICON ALUMINUM OXYNITRIDE(B-SIALON), USING DISCRETE PARTICLES, Frankie E. Phelps, et al., Owner of Record: *Aluminum Co. of America, Pittsburgh, Pa.,* Attorney or Agent: Max L. Williamson, Ex. Gp.: 110, Requester: Vesuvius Crucible Co., Pittsburgh, Pa.

4,511,666, Reexam. No. 90/001,027, Requested: June 10, 1986, Cl. 501/98, PROCESS FOR PRODUCING BETA-SILICON ALUMINUM OXYNITRIDE(B-SIALON), Frankie E. Phelps, et al., Owner of Record: *Aluminum Co. of America, Pittsburgh, Pa.,* Attorney or Agent: Max L. Williamson, Ex. Gp.: 110, Requester: Vesuvius Crucible Co., Pittsburgh, Pa.

4,514,586, Reexam. No. 90/001,016, Requested: May 29, 1986, Cl. 174/350MS, METHOD OF USING A SHIELDING MEANS TO ATTENUATE ELECTROMAGNETIC RADIATION IN THE RADIO FREQUENCY RANGE, John Waggoner, Owner of Record: *Enthone, Inc., New Haven, Conn.,* Attorney or Agent: John J. Tomaszewski, Ex. Gp.: 110, Requester: Owner

4,523,879, Reexam. No. 90/001,020, Requested: June 2, 1986 Cl. 405/217, ICE BARRIER CONSTRUCTION, Raymond G. Finucane, et al., Owner of Record: *Exxon Production Research Co., Houston, Tex.,* Attorney or Agent: Kenneth C. Johnson, Ex. Gp.: 350, Requester: Owner

4,562,069, Reexam. No. 90/001,021, Requested: May 27, 1986, Cl. 424/80, TWO PHASE FORMULATION, Ahmed Hegasy, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Sprung, Horn, et al., Ex. Gp.: 120, Requester: Owner

4,571,090, Reexam. No. 90/001,012, Requested: May 20, 1986, Cl. 366/270, MIXING STYSTEMS, Ronald J. Weetman, et al., Owner of Record: *General Signal Corp., Rochester, N.Y.,* Attorney or Agent: Martin Lukacher, Ex. Gp.: 240, Requester: Philadelphia Mixers, Palmyra, Pa.

Notice of Disbarment

Robert L. Slater, Jr., 80 Wall St., Suite 415, New York, N.Y. 10005, whose registration number is 18,107, has been disbarred and excluded from practice before the United States Patent and Trademark Office for the period of seven (7) years from Aug. 6, 1985; provided, however that after two years following said date, he may petition the Commissioner of Patents and Trademarks for reinstatement. In the event of such reinstatement prior to the end of the seven (7) year period, Mr. Slater shall be on probation during the remainder of such term.

This action was taken under the provisions of Section 32 of Title 35, U.S. Code.

June 17, 1986.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Proposed Records Control Schedule

As with most government agencies, the Patent and Trademark Office periodically updates the schedule it uses to dispose of old files, papers and records. Set forth below is a recent update of the Patent and Trademark Office's Records Control Schedule. The schedule is currently being reviewed by the National Archives and Records Administration and, following its approval, will constitute the basis for disposing of Patent and Trademark Office records.

Any comments or questions related to the proposed schedule should be directed to John Hassett, (703) 557-0183. Written comments should be mailed to:

John Hassett, Director
Patent and Trademark Office
Crystal Plz. 1, Lobby
Washington, D.C. 20231

June 17, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Commissioner's and Deputy Commissioner's Records

1. *Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff; reports; special investigations and survey reports; and related materials. (See index under Item 3).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
2. *Reports to the Commissioner.* Reports received by the Commissioner from the Patent and Trademark Office staff and maintained as separate series.
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
3. *Index to Commissioner's Correspondence and Subject Files.* Card index to records described under Item 1.
   PERMANENT. Transfer to Federal Records Center with related files. Offer to National Archives with related files.
4. *Deputy Commissioner's Correspondence and Subject Files.* Correspondence to and from other public officials, members of the public, and the Patent and Trademark Office staff, with related materials (exclusive of records retained in Item 1).
   PERMANENT. Transfer to Federal Records Center when 5 years old. Offer to National Archives when 25 years old.
5. *Policy Documentation Files.* Formal policy and procedural issuances, current and obsolete, such as organizational charts, regulations, orders, circulars,

manuals, and other types of directives, with related forms, recommendations, endorsements, clearances and comments.

PERMANENT. Transfer to FRC when obsolete. Offer to National Archives when 25 years old.

6. *Work-Flow Control and/or Statistical Reports Files.* Various periodic statistical reports used to show the flow of work through the Patent and Trademark Office and the printers, such as PALM, TRAM, PMS Statistical Reports on Patents to printers, and similar reports.

   Destroy when 5 years old or sooner if no longer needed.

7. *Production and Pendency Reports Files.* Quarterly, monthly, and biweekly statistical reports prepared to show the production and quality output of examiners and clerks and the status of the assigned projects. Reports are mainly used to evaluate the efficiency of personnel for promotion purposes.

   a. Office of Assistant Commissioners or equivalent. Transfer to FRC when 5 years old. Destroy when 10 years.

   b. Other Offices.

   Destroy when updated report is received.

8. *Special Studies Files.* Report on special studies surveys, and inspections of operations, management and systems with related papers showing their inception, scope, procedure and results.

   PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

9. *Narrative and Statistical Reports Files.* Annual or other periodic narrative and statistical reports.

   a. Reports to the Office of the Commissioner and the Offices of the Assistant Commissioners.

   PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 25 years old.

   b. Other Offices.

   Destroy when 5 years old.

10. *Internal Administrative Files.* Administrative operations files of organizational offices, consisting of:

    a. Correspondence concerning routine or temporary internal administrative matters.

    Destroy when 2 years old.

    b. Office personnel files.

    Destroy after separation of employee.

    c. Completed requisitions for services, supplies and equipment, and travel documents.

    Destroy 1 year after action is completed.

    d. Records pertaining to charity drives, bond campaigns, blood donations, and other voluntary activities.

    Destroy on completion of program.

    e. Hand receipt files.

    Destroy when property is accounted for.

    f. Suspense files.

    Destroy when purpose is served.

    g. Chronological files.

    Destroy when 2 years old.

11. *Program Planning and Evaluation Files.* Files showing the overall development of Patent and Trademark Office plans and the evaluation of their effectiveness. Included are one copy of each staff study, evaluation report, system study, and related correspondence and background materials.

    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

12. *Surplus Property Case Files.* Case files on disposal of surplus real and related personal property.

    Transfer to FRC 3 years after close of file. Destroy 10 years after close of file.

13. *Excess Real Property Reports.* Reports of real property with related papers.

    Destroy when 10 years old.

14. *Budget Policy and Procedure Correspondence Files.* Correspondence files showing Patent and Trademark Office policy and procedure governing budget administration, and reflecting expenditures for Patent and Trademark Office programs.

    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 25 years old.

15. *Budget Estimates Files.* File copies of budget estimated comprising appropriation language sheets, narrative statements, and related schedules and data.

    PERMANENT. Transfer to FRC after 10 years. Offer to National Archives when 25 years old.

16. *Records Disposition Files.* Descriptive inventories, disposal authorizations, schedules for retirement of records and correspondence or memoranda relating t o revisions.

    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

17. *Forms Files.* One copy of each form with data showing the inception and scope of the form, the program or administrative purpose of the form, and the related procedure instituted, revised, superseded, or canceled.

    PERMANENT. Offer to National Archives when 25 years old or when no longer needed, whichever is longer.

18. *Systems Development Program Files.* Program documents, schedules, and correspondence pertaining to the execution, review, and analysis of Patent Office research and development programs, and relating to the general planning and supervision of the programs.

    PERMANENT. Transfer to FRC 5 years after completion to program. Offer to National Archives 20 years later or when 25 years old, whichever is sooner.

19. *Systems Development Task Force, Committee, and Board Files.* Agendas, directives, minutes of meetings, and related papers, of Task Forces, Committees, Board, etc. of which the Patent Office serves as Secretary, or Chairman thereof.

    PERMANENT. Transfer to FRC 5 years after close of file. Offer to National Archives 20 years later or after 25 years old, whichever is sooner.

20. *Technical Report Files.* One copy of each technical report of unpublished manuscript or report prepared in connection with a project, terminal narratives, statistical and graphic complications, summarizations, analyses, and related papers.

    PERMANENT. Transfer to FRC when 5 years old. Offer to National Archives when 25 years old.

21. *Systems Development Project Case Files.* Project case files reflecting a complete history of each project from initiation through research, development, design, and testing to completion.

    PERMANENT. Transfer to FRC 5 years after completion or termination of project. Offer to National Archives when 25 years old.

ADP Records
(also in GRS 20)

22. *ADP Planning Documents Files.* Planning documents consisting of master plan, feasibility studies with associated charts and diagrams, and supporting data that reflect on characteristics of the data automation activity.

    PERMANENT. When no longer needed or used offer to National Archives with related materials.

23. *ADP Program Management Files.* Program management documents consisting of the development of plans, policy, and procedures governing the conversion of electrical machine operations and the supervision, control, coordination, and operation of the mechanization program.

    PERMANENT. Offer to National Archives with related materials.

24. *ADP Standardizations Files.* Standardization files consisting of data elements and codes, standardiza-

tion requests, and jusification for all data systems developed by or for the Patent Office.
PERMANENT. Offer to National Archives with related materials.

25. *ADP Data Systems Planning Files.* Documents containing definition of the system.
PERMANENT. Offer to National Archives with related materials.
26. *ADP Information Retrieval System Master Reference File.* Magnetic media containing an index to patents and trademarks and publications.
PERMANENT. Offer to National Archives on termination of Patent and Trademark Office.
27. *Publication Tape File.* Magnetic media which are reproduced and disseminated as publication or used for reproducing a printed publication.
PERMANENT. Offer to National Archives when publication needs cease.

Patent Records

28. *Advertising Files.* Copies of proposed advertising matter, circulars, letters, cards, and related correspondence intended to solicit patent business and submitted by registrants as required by regulations.
Destroy when 25 years old.
29. *Complaint Files.* Case files relating to complaints made against attorneys registered to practice before the Patent Office.
Destroy on death of attorney.
30. *Board of Appeals Decisions Files.* Copies of Board of Appeals decisions with related background materials.
a. Cases patented.
Destroy 10 years after patent issued.
b. All others.
Destroy 10 years after appeal is decided.
31. *Indexes to Appeal Cases.* Indexes, arranged in various ways, to the appeal cases.
Destroy 30 years after date of appeal.
32. *Declaration of Assistance Received Files.* Form received from applicants showing assistance received, if any, in the preparation of application for patent (PTOL–284).
33. *Academy Lecture Files.* Lectures prepared by the Staff for presentation at the Academy. (These lectures are updated periodically to reflect the changing views of the Patent and Trademark Office)
a. Historical Sample
PERMANENT. Retain 1 copy of each basic lecture and of any major changes made to it. Offer to NARS when 25 years old.
b. All other copies.
Destroy when obsolete.
34. *Academy Training Sessions Files.* Background materials relating to each session of the Patent Office Academy, including names of attendees and instructors, schedule of classes, evaluation sheets, and related materials.
PERMANENT. Offer to National Archives when 25 years old.
35. *Academy Examinations Files.* Completed examinations of persons attending the Academy.
Destroy when 1 year old.
36. *Academy Application Files.* Applications for training in the Academy, including memoranda of agreement and personal history statements.
Destroy when 2 years old.
37. *Academy Correspondence File.* Correspondence relating to the courses offered by the Patent Office Academy.
Destroy when 5 years old.
38. *Disclosure Document File.* Documents submitted by inventors as evidence of the date of conception of an invention.
a. Disclosure Documents referred to in a separate letter in a related patent application filed within two years.
Dispose of with related patent application.
b. Disclosure Documents *not* referred to.
Destroy when 2 years old.
39. *Disclosure Documents Index.* Cross-reference index to Disclosure Documents maintained by inventor's name and includes DD number and date of receipt.
Destroy with related DD's.
40. *Index to Patents Available for License or Sale.* Index created when a patent is made available for license or sale, issued to the U.S. Government or dedicated to the Public.
Destroy when no longer needed for reference.
41. *General Correspondence File.* Consists mainly of inquiries and requests for information and publications. Also includes correspondence regarding the "Register of Patents Available for License or Sale."
Destroy when 3 years old.
42. *Foreign Filing Licensing Documents.* Petitions to the Commissioner of Patents and Trademarks for license to file applications for patents in foreign countries.
Destroy 25 years after date of issue.
43. *Indexes to Foreign Filing Licensing Documents.* Indexes to licensing documents described in Item 43.
Destroy 25 years after issue.
44. *Transmittals to Other Agencies Files.* Copies of transmittal letters to other agencies enclosing correspondence and related enclosures sent to the Patent and Trademark Office for services rendered by other agencies, such as copyright information and requests for publications from the Government Printing Office.
Destroy when 1 year old.
45. *D-1 Files.* Files relating to patent applications which may have a bearing on national security. Files usually consist of form listing serial number of application filing date, examining unit, title of invention, attorney assignee, and the concurrences listing the recommendation, signature, agency, and date; a memorandum summary indicating whether a secrecy order is required; the defense agency's request for a secrecy order; the secrecy order issued; and related materials.
Destroy 35 years after date of receipt for review.
46. *Drawing Correction Slips.* Index arranged by serial number of application and used to locate orders for correction of drawings.
Destroy when 2 years old.
47. *Inventor's Index to Patent Applications.* Index arranged alphabetically by name of the inventor. Each slip shows the inventor's name and residence, title of the invention, name and address of the attorney, application serial number and the filing date of the application.
PERMANENT. Offer to National Archives when no longer needed for reference.
48. *Numerical (serial) Index to Patent Applications.* Index arranged by the serial number assigned to the application.
PERMANENT. Offer to National Archives when no longer needed for reference.
49. *Assignment Document Files and Index.* Copies of documents assigning and transferring from one party to another the rights, title, and interest to trademarks and inventions and the letters patent obtained therefrom with related indexes.
PERMANENT. Offer to the National Archives when no longer needed for current business.
50. *Indexes to Government Interests.* Indexes to patents in which the Federal government has an interest by virtue of either of ownership of the application or resulting patent, thru assignment, or receipt of a license.
a. Government Agency Index.
PERMANENT. Offer to National Archives when no longer needed for reference.
b. Patent Number Index.
Destroy when no longer needed for reference.
c. Assignor Index.
Destroy when no longer needed for reference.

51. *Petitions to the Commissioner.* Petitions to the Commissioner concerning patent applications.
    a. Original petitions in patent case file.
    Dispose of with related case file.
    b. Other copies.
    Destroy when 2 years old.
52. *Patent Protest Letters.* Protest to the grant of a patent (Rule 291).
    a. Letters filed in patent case file.
    Dispose of with related case file.
    b. Others.
    Destroy when 5 years old.
53. *Patent Docket Cards.* Cards used to control patent applications.
    Destroy when 6 months old.
54. *Classifications Definitions Files.* One copy of each issuance of *Classifications Definitions,* with related background papers.
    PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.
55. *Canceled Drawings.* Drawings that were canceled because they did not meet Patent and Trademark Office specifications. Copy of drawing is filed with application.
    Destroy 5 years after filing date.
56. *Abandoned Patent Application Files.* Patent applications that did not result in a patent.
    a. Those that are retained because they are referred to in another application that may have become patented.
    Dispose of with patent file in which cited.
    b. All others.
    Destroy when 20 years old.
57. *Patent Files.* Case files showing the prosecution of application for, and the granting of, a patent. Includes the original application, copy of drawing, and all material relating to the prosecution of the application and subsequent actions by the Patent and Trademark Office.
    a. Files selected by the Commissioner of Patents and Trademarks or the Archivist of the U.S.
    PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
    b. All others.
    Destroy when 35 years old.
58. *Patent File Charge-out Records.* Record showing name of person charging out a patent file.
    Destroy after file is returned and all papers are determined to be in file.
59. *Statistical Reports on Patents to Printers Files.* Weekly statistical report to management concerning the number of patents sent to the printers and the amount of backlog.
    a. Original Report.
    Destroy when 5 years old.
    b. Operating Unit Copy.
    Destroy when 2 years old.
60. *Quality Review of Sample of Allowed Applications.* Records relating to the examination of allowed applications sampled for quality review, includes query to the examining group and their reply.
    Destroy 1 year after ultimate disposition of related case.
61. *Sample Pull-Rate Files.* Form showing which of the allowed applications are to be selected for the quality review sample, includes the pull rate and list of applications by serial number.
    Destroy when 1 year old.
62. *Printer-Waiting Register Files.* Register showing status of Query Disposition Records return to a group for reply.
    Destroy when 1 year old.
63. *Query Disposition Record Files.* Form used to return printer-waiting cases to a group for answer to a specific query.
    Destroy 6 months after query is returned.
64. *Batch Control Sheet for Allowed Cases Files.* Form uses as input to PALM System showing routing control and batch contents, such as PTO Form 1238–1.
    Destroy when 1 year old.
65. *Checklist for Applications Allowed by Examiner File.* Form used in completing a final review of allowed applications before sending to the printer, such as PTO Form 1167.
    Destroy when 1 year old.
66. *Patent Interference Files.* Case files produced in the process of resolving of adjudicating conflicts arising between parties in this matter of priority of invention.
    a. Cases that reach the hearing stage.
    PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 40 years old.
    b. Cases that are abandoned before reaching a hearing.
    Destroy when 40 years old.
67. *Board of Interference Decisions.* Copies of Board of Interference Decisions.
    PERMANENT. Offer to the National Archives when 40 years old.
68. *Index to Patent Interferences.* Arranged numerically by interference number. Shows names of parties involved, application serial number and/or patent numbers involved, subject of interference, sections, date of hearings, decisions rendered, and other remarks.
    PERMANENT. Offer to National Archives when 40 years old.
69. *Index to Interference Exhibits.* Describes exhibits in each interference.
    Destroy when 40 years old.
70. *Proceedings Under AEC and NASA Acts.* Separate series of interference files relating to the SEC and NASA Acts.
    Dispose of with related patent files.
71. *Settlement Agreements.* Files relating to the settlement agreed to by parties in the interference.
    Dispose of with related interference case file.
72. *Court Cases.* Proceedings in cases where the Commissioner is a party of a civil suit.
    a. Cases selected by the Solicitor as being precedent setting or of historical or political significance.
    PERMANENT. Offer to the National Archives when 30 years old.
    b. All other cases.
    Destroy when 30 years old.
73. *Index to Court Cases.* Card index to cases described under Item 72.
    Retain in agency until no longer needed for reference.
74. *Roster of Registered Patent Attorneys and Agents.* Printout listing registered patent attorneys and agents.
    Destroy after undated listing is received.
75. *Case Folders of Registered Attorneys and Agents.* Application folders of the attorneys, agents, or firms registered to practice before the Patent and Trademark Office.
    Destroy on death of attorney or agent.
76. *Unsuccessful Application for Registration to Practice before the Patent and Trademark Office.* Application folders of those applicants who failed to be registered.
    Destroy 5 years after date of examination.
77. *Examination Papers of Applicants for Registration.* Examination answer papers to applications for registration to practice before the Patent and Trademark Office.
    Destroy after grades are recorded.

Trademark Records

78. *Trademark Examiners Work Reports.* Records showing amount of work processed by examiners in a

given time. Used to evaluate examiners work and progress.

Destroy when 5 years old.

79. *Trademark Adversary Proceedings Files.* Consists of Trademark Opposition, Cancellation, Interference, and Concurrent-Use proceedings files.

Destroy when 25 years old. Check with the Chairman of the Trademark Trial and Appeal Board before destruction. General Services should generate a list of files to be destroyed and send to the Search Room to destroy matching cards in Adversary Proceeding file.

80. *Canceled Trademark Registration Files.* Consists of original application and all related correspondence.

Destroy 2 years after the date of cancellation.

81. *Expired Trademark Registration Files.* Consists of original application and all related correspondence.

Destroy 2 years after expiration of registration.

82. *Abandoned Trademark Application Files.* Consists of original application and all related correspondence.

Destroy 2 years after date of abandonment.

83. *Trademark Renewal Index.* Index to trademark registrations that are renewed.

PERMANENT. Offer to National Archives when no longer needed for reference.

84. *Indexes to Trademark Applications.* Index shows applicant's name, serial number of application, filing date, name of mark description of goods, attorney's name, and final disposition of the application.

a. Applicant's Index.

PERMANENT. Offer to National Archives when no longer needed for reference.

b. Serial Index.

PERMANENT. Offer to National Archives when no longer needed for reference.

85. *Proceedings Index to Trademark Adversary Proceedings.* Index in the Trademark Public Search Library arranged by type of proceeding.

Destroy card from list sent by the Warehouse after matching Adversary Proceeding file is destroyed.

86. *Trademark Adversary Proceedings Records.* Card file maintained at the Trademark Trial and Appeal Board, showing records of Trademark Adversary Proceedings, with information on mark, parties, disposition, termination date, etc.

PERMANENT. Offer to National Archives when no longer needed for reference.

87. *Trademark Registrant's Index.* Index to Trademark registrant's name, includes serial and registration numbers, date of registration, line of goods and other related information.

PERMANENT. Offer to National Archives when no longer needed for reference.

88. *Index to Trademark Trial and Appeal Board Ex Parte Cases.* Record of Trademark Trial and Appeal Board cases in ex parte appeals.

PERMANENT. Offer to National Archives when no longer needed for references.

89. *Public Advisory Committee for Trademark Affairs Files.* Agenda, minutes, correspondence, reports, working papers, reference materials, and related supporting files.

Destroy when 10 years old or no longer needed for reference.

90. *Trademark Petitions Files.* Petitions and decisions to the Commissioner relating to trademarks, with related materials.

a. Original Petitions in trademark case file.

Dispose of with related case file.

b. Copies of petition decisions in petition number order and in subject order in the Assistant Commissioner's Office.

PERMANENT. Offer to the National Archives when no longer needed for references.

c. Other copies.

Destroy when 2 years old.

91. *Trademark Protest Letters.* Letters of protest to the Commissioner related to trademarks.

Destroy when no longer needed or when three years old, whichever is earlier.

Public Information and Service Records

92. *International Intellectual Property Activities Case Files.* Project case files showing Patent and Trademark Office activity relating to problems concerning the protection of intellectual property throughout the world. Includes correspondence with private individuals, the Department of State and other countries; reports; records of international meetings concerning patents; trademarks and other matters pertaining to the protection of intellectual property throughout the world; and other materials relating to international affairs.

PERMANENT. Transfer to FRC 5 years after close of case. Offer to National Archives when 25 years old.

93. *Proposed Intellectual Property Legislation Files.* Documents accumulated in the preparation and processing of legislation proposed by or in the interest of the Patent and Trademark Office. Includes drafts of legislation, reports to committees on introduced legislation, and comments on legislative proposals.

PERMANENT. Transfer to FRC after 5 years. Offer to National Archives when 25 years old.

94. *Printed Articles Files.* Articles submitted for clearance and printed in magazines, journals, and other information media, including related background materials.

Destroy when 10 years old.

95. *Public Affairs Report.* Weekly, monthly, and quarterly reports relating to public affairs activities prepared for the Department of Commerce.

Destroy when 6 months old.

96. *Speakers Files.* Correspondence, schedules, travel material and related records concerning the scheduling of Patent and Trademark Office speakers.

Destroy when 3 years old.

97. *Exhibit Files.* Correspondence, photographs, reports and related materials concerning major exhibits developed by the Patent and Trademark Office, such as the 175th anniversary exhibit.

PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

98. *Photograph Files.* Photographs of key Patent and Trademark Office officials, major exhibits and other subjects that related to the functioning of the Patent and Trademark Office. Includes the negative and one positive print.

PERMANENT. Offer for transfer to the National Archives when 20 years old.

99. *Publications Files.* Official record copy of each publication that contributes to an understanding of the organization and functioning of the Patent and Trademark Office.

PERMANENT. Transfer to FRC when 10 years old. Offer to National Archives when 30 years old.

100. *Speech Files.* Official records copy of each speech given by the Commissioner and other Patent and Trademark Office executives.

PERMANENT. Transfer to FRC when 10 years old. Offer to the National Archives when 30 years old.

101. *News Release Files.* Official records copy of each new release.

PERMANENT. Transfer to Federal Records Center when 10 years old. Offer to National Archives when 30 years old.

102. *Patents Received and Files Register.* Register showing date and number of patent cases received in search room and date filed.

Destroy 2 years after date of last entry in volume.

103. *Reports on Search Room Activities Files.* Weekly, monthly and other periodic reports showing production and general activities of the public search

room, with related background papers.
a. Original Report.
Destroy when 1 year old.
b. Operating Office Copy.
Destroy when 2 years old.

104. *Patent and Trademark Reproduction Copy Files.* The master copy of patents and trademarks used for the photoreproduction of sales copies, includes original drawings and specifications.
Transfer to FRC when 10 years old. Destroy when 20 years old.

105. *Reprint Requisition File.* Requisitions, such as PTO Form 228, used for ordering the reprint or printed patents or trademarks after current stock is depleted.
Destroy when 1 year old.

106. *Sales Journal.* Shows statistical information on sales of copies of patents and trademarks.
Destroy when 5 years old.

107. *Correspondence and Sale Control Records.* Records used to control the flow of correspondence and sale of printed materials.
Destroy when 1 year old.

108. *Requests for Publications.* Correspondence requesting copies of certain publications and other printed materials.
Return requests with ordered materials.

109. *Microform Files.* Microform copies of applications as filed, printed patent files and printed trademark files.
a. Master microfilm files. (Certified as processed under 41 CFR 101-11.504)
PERMANENT. Transfer to classified site. Offer to National Archives when 25 years old.
b. All other microform copies
Non-Records

110. *Charged-Out Slips File.* Slips recording the charge-out of records to Patent and Trademark Office employees and the public, such as PTO Forms 124, 125, and 271.
Destroy when records are returned.

111. *Binding Instructions.* Cards showing instructions on how the various publications received by the library are to be bound.
Destroy when no longer needed.

112. *Charge-out Files of Library Materials.* Sets of 3" × 5" cards showing records of library materials on temporary or indefinite loan to researchers or Patent and Trademark Office staff.
Destroy when obsolete or on return of book.

113. *Interlibrary Loans Files.* Records of books borrowed from other libraries.
Destroy 2 years after return of book.

114. *Library Serial Order Cards.* 3" × 5" cards used to record purchase of journals, magazines, etc.
Destroy when no longer needed for reference.

115. *Library Book Order Cards.* 3" × 5" cards showing book purchases.
Destroy when no longer needed for reference.

116. *Foreign Patent Accession Register.* Bound volumes arranged by country. Each shows the patent number and the date that copy was received in the Patent and Trademark Office.
Destroy when no longer needed for reference.

117. *Inventor's Index.* Arranged alphabetically by name of inventor. Shows name and address of inventor, title of invention, serial number of application, patent number, date of issuance, attorney, and assignee.
PERMANENT. Offer to National Archives when no longer needed for reference.

118. *PTO Procurement Files.* Contract, requisition, purchase order, lease, and bond and surety records, including correspondence and related papers pertaining to award, administration, receipt, inspection and payment (other than those covered in Items 1, 2, 13, and 15).
a. Procurement or purchase organization copy, and related papers.
1. Transactions of more than $10,000 and all construction contracts exceeding $2,000.
Destroy 6 years and 3 months after final payment.
2. Transactions of $10,000 or less and construction contracts under $2,000.
Destroy 3 years after final payment. (Close file at the end of the fiscal year, retain 3 years and destroy, except that files on which actions are pending shall be brought forward to the next fiscal years's files for destruction therewith.)
b. Obligation copy.
Destroy when funds are obligated.
c. Other copies of record described above used by component elements of a procurement office for administrative purposes.
Destroy upon termination or completion.

119. *Solicited and Unsolicited Bids and Proposals Files.*
a. Successful bids and proposals.
Destroy with related contract case files (see item 118 of this schedule.)
b. Solicited and unsolicited unsuccessful bids and proposals.
1. When filed separately from contract case files.
Destroy when related contract is completed.
2. When filed with contract case files.
Destroy with related contract case files (see item 118 of this schedule.)
c. Cancelled Solicitations Files.
1. Formal solicitations of offers to provide products or services (e.g., Invitations for Bids, Requests for Proposals, Requests for Quotations) which were cancelled prior to award of a contract. The files include presolicitation documentation on the requirement, any offers which were opened prior to the cancellation, documentation on any government action up to the time of cancellation, and evidence of the cancellation.
Destroy 5 years after date of cancellation.
2. Unopened Bids.
Return to bidder.
d. Lists or Card Files of Acceptable Bidders.
Destroy when superseded or obsolete.

120. *Public Printer Files.* Records relating to requisitions on the Printer, and all supporting papers.
a. Printing procurement unit copy of requisition, invoice, specifications, and related papers.
Destroy 3 years after completion or cancellation of requisition.
b. Accounting copy of requisition.
Destroy 3 years after period covered by related account.

Non Record Materials

The Records Disposal Act of 1943, as amended, states that "library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference, and stocks of publications and of processed documents are not included within the definition of the word 'records' as used in this Act." Non-record material is disposed of as soon as its purpose is served. The following list consists of those non-record materials that are unique to the Patent and Trademark Office.

121. *Foreign Patents.* Copies of patents issued by foreign countries.

122. *Translation of Foreign Patents and Publications and Related Indexes.* Typewritten copies of translations and related indexes.

123. *Card Catalogs.* 3" × 5" cards used as finding aids to the library.

124. *Patent Examiner's Search Files.* Reference file used by examiners in processing applications. Arranged by class and subclass and consist of U.S. patents, foreign patents, extracts from publications, and other materials relating to a certain class or subclass.

125. *Printed Trademark Registrations Reference Files.* Digest of Registered marks consisting of a set of regis-

tered work marks arranged alphabetically and secondarily by trademark registration number; a set of registrations comprising symbols, arranged according to the classification of the goods or services with which they are used; of registration arranged by registration number.

126. *Numerical Index to Patent Classification.* Arranged numerically by patent number and shows the class and subclass assignment of each patent.

127. *Shelf List of Classified Patents.* Listing of all U.S. Patent numbers comprising, respectively, the "original" and "cross reference" classification of patents according to the official classification of the Patent and Trademark Office.

128. *Public Search Files of U.S. Patents.* Printed or microfilm copies of U.S. Patents arranged in two series: 1) numerically by class and subclass assignment, and secondarily by patent number and 2) numerically by patent number.

129. *Legislative History Files.* Consist mainly of copies of published materials relating to legislation that is of interest to the Patent and Trademark Office. Includes copies of bills, public laws, Federal Register, Congressional Record, and similar materials.

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Removal from Register

Pursuant to the provisions of 37 CFR §10.11(b), a letter was directed on Nov. 18, 1985, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address.

Accordingly, the names of the following persons have been removed from the Register of Patent Attorneys and Patent Agents.

May 21, 1986.

CAMERON WEIFFENBACH,
Director, Office of Enrollment & Discipline.

Crawford, James A., 11 Commerce St., Apt. 1437, Neward, N.J. 07102

Flynn, Steven H., 2187 Pond View Ct., Reston, Va. 22091
Gladding, Francis N., Sr., O'Brien & Jacobson, 1325 G St., N.W., Washington, D.C. 20005

U.S. Patent and Trademark Office
Attorney Roster Survey

Tachner, Leonard, Fischer, Tachner & Strauss, Suite 270, 1301 Dove St., Newport Beach, Calif. 92660
Tang, Henry Y. S., Bell Laboratories, 600 Mountain Ave., Murray Hill, N.J. 07974
Tarr, Howard C., Suite 2100, 110 W. C St., San Diego, Calif. 92101
Taylor, John E., 2009 N. Geyer Rd., St. Louis, Mo. 63131
Taylor, Kenneth M., Jr., Fish & Neave, 277 Park Ave., New York, N.Y. 10172
Taylor, Kevin S., 650 59th St., Brooklyn, N.Y. 11220
Taylor, Richard Girsch, American Cyanamid Co., Rm. 514 A, 1937 W. Main St., Stamford, Conn. 06904
Taylor, Willis H., Jr., Pennie & Edmonds, 330 Madison Ave., 11th Fl., New York, N.Y. 10017
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Templar, Lance C., P.O. Box 3369, Manhattan Beach, Calif. 90266
Templin, Robert S., 53 S. Main St., Medford N.J. 08055
Tenenbaum, Leon E., Revlon, Inc., 767 5th Ave., New York, N.Y. 10022
Thienpont, Frank R., Dulin, Thienpont & Potthast, Ltd., Suite 2060, 208 S. La Salle St., Chicago, Ill. 60604
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Thomas, Bradley S., 2316 Harcroft Rd., Timonium, Md. 21093
Thomas, J. Michael, 293 Molimo Dr., San Francisco, Calif. 94127
Thomas, John A., Suite 404, 3131 Turtle Creek Blvd., Dallas, Tex. 75219
Thomas, Ralph L., Thomas and Thomas, 6577 Backlick Rd., Springfield, Va. 22150
Thomas, Terry R., Republic Geothermal, Inc., Suite One, 11823 E. Slauson Ave., Sante Fe Springs, Calif. 90670
Thompson, Alan H., P.O. Box 771, Glendora, Calif. 91740
Thompson, Irvin S., Young and Thompson, Suite 903, 2001 Jeff. Davis Hwy., Arlington, Va. 22202
Thompson, Thomas M., Suite 703, 1911 Jeff. Davis Hwy., Arlington, Va. 22202
Thorpe, Calvin E., Thorpe, North & Gold, Suite 100, 9136 South State, Sandy, Utah 84070
Tierney, James David, Mobil Oil Corp., 3225 Gallows Rd., Fairfax, Va. 22037
Tighe, Thomas J., Suite B, 7830 Clairemont Mesa Blvd., San Diego, Calif. 92111
Tillson, Paul Lambert, Gulf Oil Corp., P.O. Box 1166, Pittsburgh, Pa. 15219
Tingley, F. Stuart, 4740 Conn. Ave., N.W., Apt. 1006, Washington, D.C. 20008
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Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on Apr. 8, 1986 were mailed to 378 candidates on June 20, 1986. The following list contains the names of persons who successfully passed the examination. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) for a period of 90 days from June 20, 1986 to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Aug. 22, 1986.

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June 20, 1986.

CAMERON WEIFFENBACH,
Director, Office of Enrollment and Discipline.

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 4,039,304, Horst Bechthold and Paul Bottger, METHOD OF REMOVING SO_2 AND/OR OTHER ACID COMPONENTS FROM WASTE GASES, Interferences No. 101,317, decided Apr. 17, 1986, claims 1, 2, 3, 10 & 11.

Patent No. 4,224,401, Shunji Takada, Yoshitaka Akimura, Hiroyuki Mifune and Nobuyuki Tsujino, SILVER HALIDE PHOTOGRAPHIC EMULSIONS AND IMAGE FORMING PROCESS, Interference No. 100,740, decided Dec. 11, 1985, claims 1-3, 8, 11 & 14-17.

Patent No. 4,234,585, Werner Winter, Walter-Gunar Friebe, Wolfgang Kampe, Androniki Roesch and Otto-Henning Wilhelms, 1,2-DIHYDROQUINOLINE-2-ONE DERIVATIVES, Interference No. 100,864, decided Dec. 11, 1985, claims 3, 4, 5, 6 & 9.

Patent No. 4,296,949, Andrew J. Muetterties, John L. Vcelka and Wayne R. Kelsey, ROTATABLE CONNECTING DEVICE FOR I.V. ADMINISTRATION SET, Interference No. 101,097, decided Apr. 28, 1986, claims 1-4, 6, 7, 10, 11, 13-16 & 18.

Patent No. 4,397,887, Haluk M. Aytac and John F. MacDonald, POSTPONED ROM PROGRAMMING, Interference No. 101,247, decided Feb. 7, 1986, claims 1, 2 & 4.

Patent No. 4,431,658, Adriano Afonso and Frank Hon, AZA PENEM COMPOUNDS, Interference No. 101,315, decided Aug. 5, 1985, claim 1.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Appeals and Interferences.

PATENT NOTICES

Certificates of Correction for the Week of July 15, 1986

Re. 32,078	4,536,432	4,562,823	4,579,610
Re. 32,114	4,537,024	4,562,877	4,579,704
D. 277,070	4,537,158	4,562,899	4,579,964
D. 279,836	4,537,895	4,563,140	4,580,627
4,237,241	4,538,982	4,564,358	4,580,719
4,318,778	4,541,707	4,565,585	4,580,843
4,353,893	4,543,176	4,566,096	4,580,936
4,361,116	4,543,307	4,566,231	4,581,021
4,362,365	4,543,699	4,567,028	4,581,350
4,369,207	4,546,001	4,567,979	4,581,434
4,435,042	4,547,770	4,569,164	4,581,441
4,443,216	4,550,308	4,569,216	4,581,451
4,443,611	4,550,393	4,569,664	4,581,592
4,443,884	4,550,893	4,569,703	4,581,629
4,446,285	4,551,326	4,570,321	4,581,927
4,450,062	4,551,387	4,570,871	4,581,987
4,459,198	4,551,763	4,571,066	4,582,067
4,480,117	4,552,214	4,571,468	4,582,068
4,481,589	4,552,773	4,572,048	4,582,118
4,487,779	4,553,084	4,572,260	4,582,471
4,492,032	4,554,293	4,572,512	4,582,478
4,493,115	4,554,674	4,572,954	4,582,484
4,493,365	4,554,823	4,573,360	4,582,598
4,497,330	4,555,761	4,574,271	4,582,709
4,502,917	4,556,107	4,575,328	4,583,710
4,506,010	4,556,610	4,575,516	4,584,107
4,509,264	4,556,998	4,576,138	4,584,226
4,509,272	4,557,013	4,576,273	4,584,244
4,510,323	4,557,195	4,576,685	4,584,348
4,511,522	4,557,565	4,576,932	4,584,554
4,511,989	4,558,324	4,577,115	4,584,635
4,512,152	4,558,874	4,577,208	4,584,737
4,519,934	4,559,338	4,577,870	4,585,150
4,523,715	4,559,718	4,578,016	4,585,215
4,523,807	4,559,847	4,578,324	4,585,913
4,524,951	4,560,041	4,578,343	4,586,878
4,526,519	4,560,372	4,578,781	4,587,254
4,528,969	4,560,484	4,579,114	4,587,444
4,531,050	4,560,774	4,579,202	4,587,645
4,533,367	4,562,365	4,579,327	4,587,654
4,533,807	4,562,533	4,579,454	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
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	Springfield: Illinois State Library	(217) 782-5430
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
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	St. Louis Public Library	(314) 241-2288 Ext. 390
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New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
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Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
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Rhode Island	Providence Public Library	(401) 521-8726
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 7, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	10-12-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-18-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-28-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	2-01-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-26-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-06-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during June 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,447,160 to 3,452,361, inclusive

Plant Patents . . . . . Numbers 2,890 to 2,896 inclusive

REEXAMINATIONS

JULY 15, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,905,828 (526th)
ELECTROLYTIC PROCESSES AND ELECTRODES THEREFOR

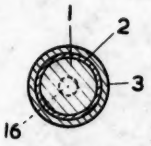
Anthony C. Barber, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, England

Reexamination Request No. 90/000,344, Mar. 15, 1983.
Reexamination Certificate for Patent No. 3,905,828, issued Sep. 16, 1975, Ser. No. 436,348, Jan. 24, 1974.

Claims priority, application United Kingdom, Feb. 8, 1973, 6187/73; Mar. 26, 1973, 14349/73; Apr. 13, 1973, 17828/73; Jun. 28, 1973, 30757/73

Int. Cl.[4] H01M *4/58*

U.S. Cl. 429—218



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–22** are cancelled.

New claims **23–48** are added and determined to be patentable.

[1. A method of manufacturing a composite body comprising an elongate body of a film forming metal selected from the group consisting of titanium, tantalum, niobium, zirconium and their alloys with a sheath of a precious metal which comprises the steps of surrounding a body of a film-forming metal with a sheath of a precious metal surrounding the body and sheath with a sleeve of solid deformable protection and lubrication material, sealing the body and sheath into the sleeve, and extruding the assembly so formed to produce the elongate body.]

B1 4,186,982 (527th)
CONTACT WITH SPLIT PORTION FOR ENGAGEMENT WITH SUBSTRATE

Robert F. Cobaugh, Elizabethtown, and James R. Coller, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Reexamination Request No. 90/000,640, Sep. 28, 1984.
Reexamination Certificate for Patent No. 4,186,982, issued Feb. 5, 1980, Ser. No. 810,703, Jun. 28, 1977.
Continuation-in-part of Ser. No. 698,240, Jun. 21, 1976, abandoned, which is a continuation of Ser. No. 481,577, Jun. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 440,899, Feb. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 384,852, Aug. 1, 1973, abandoned.

Int. Cl.[4] H01R *9/09;* **H05K** *1/12*

U.S. Cl. 339—17 C

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** and **36–38** is confirmed.

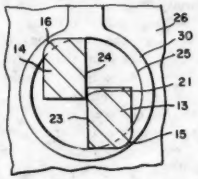
Claims **18–35** are cancelled.

New claims **39–53** are added and determined to be patentable.

1. A contact for insertion into an aperture extending between upper and lower surfaces of a substrate comprising:

a pair of offset legs extending along a longitudinal axis adapted to extend at least part way through said aperture and to tightly engage the peripheral surface of said aperture;

said legs being joined at their ends for compliant movement throughout their offset lengths relative to each other in a first direction substantially normal to said axis during insertion into said aperture so as to reduce their combined cross-sectional dimension thus permitting accommodation by said aperture;



said legs being in a mutually touching relationship for a majority of the distance they extend into said aperture along longitudinally extending friction surface means in a plane constructed between said legs upon completion of insertion of said legs to their final position of stable support within said aperture;

said plane being so constructed that the maximum combined cross-sectional dimension of said legs is reduced during insertion into said aperture without causing any increase in the combined cross-sectional dimension of said legs in a direction perpendicular to said plane; and

said friction surface means resisting said compliant movement of said legs relative to each other in said first direction.

B1 4,217,027 (528th)
OPTICAL FIBER FABRICATION AND RESULTING PRODUCT

John B. MacChesney, Stirling, and Paul B. O'Connor, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Reexamination Request No. 90/000,810, Jul. 2, 1985.
Reexamination Certificate for Patent No. 4,217,027, issued Aug. 12, 1980, Ser. No. 828,617, Aug. 29, 1977.
Continuation of Ser. No. 444,705, Feb. 22, 1974, abandoned.

Int. Cl.[4] G02B *6/16*

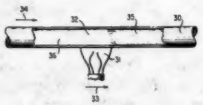
U.S. Cl. 350—96.3

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **26** are determined to be patentable as amended.

Claims **2–25**, dependent on an amended claim, are determined to be patentable.

1. Process for fabrication of a glass fiber optical transmission line, comprising a core section and a cladding, wherein the cladding has an index of refraction of a value lower than the maximum index of the core for energy of the wavelength to be transmitted, comprising introducing a moving stream of a vapor mixture including at least one compound glass-forming precursor together with an oxidizing medium into a tube while heating the tube so as to react the said mixture and produce a glassy deposit on the inner surface of the tube, characterized in that heating of tube and contents are by a moving hot zone produced by a correspondingly moving heat source external to the tube in that combustion within the tube is avoided and in



that temperature within the hot zone, composition of the vapor mixture, and rate of introduction of the vapor mixture are maintained at values such that at least a part of the reaction takes place within the gaseous mixture at a position spaced from the inner walls of the said tube, thereby producing a *visible* suspension of oxidic reaction product particulate material, whereby the particulate material while traveling downstream comes to rest on the inner surface of the tube within a region which extends from a position within the said hot zone, the moving zone serving the dual functions of: nucleation site for homogeneous reaction to produce particulate matter; and consolidation site for previously produced particulate matter.

25. Article produced in accordance with the process of claim 1.

B1 4,288,327 (529th)

COPOLYMERS FOR THE CONTROL OF THE FORMATION AND DEPOSITION OF MATERIALS IN AQUEOUS MEDIUMS

Irene T. Godlewski, Cinnaminson, N.J.; Joseph J. Schuck, Holland, and Andrew S. Chisarik, Cornwells Heights, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Reexamination Request No. 90/000,737, Mar. 11, 1985.
Reexamination Certificate for Patent No. 4,288,327, issued Sep. 8, 1981, Ser. No. 4,646, Jan. 19, 1979.
Continuation-in-part of Ser. No. 689,755, May 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,952, Sep. 8, 1975, abandoned.
Int. Cl.[4] C02F *5/10*
U.S. Cl. 210—698

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **59** is confirmed.

Claims **1, 11, 23–26, 31, 40, 57** and **58** are determined to be patentable as amended.

Claims **2–10, 12–22, 27–30, 32–39** and **41–56**, dependent on an amended claim, are determined to be patentable.

New claims **60–67** are added and determined to be patentable.

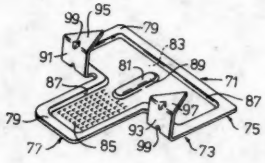
1. A method of controlling the formation and deposition of materials on the structural parts of a system containing [an aqueous medium] *water*, which in turn contains ions which would otherwise form and deposit as said materials, which comprises introducing into the [aqueous medium] *water* an effective amount for the purpose of a polymer or the water soluble salt of said polymer, which polymer is comprised of sulfonated styrene moieties and moieties derived from maleic anhydride, the ratio of said styrene moieties to said maleic anhydride derived moieties being from about 2:1 to about 4:1.

B1 4,333,286 (530th)

WALLS AND PARTITIONS AND CONCEALED FASTENERS FOR ASSEMBLY THEREOF

Roger N. Weinar, 19 Parkside Ave., Hamburg, N.Y. 14075

Reexamination Request No. 90/000,846, Aug. 20, 1985.
Reexamination Certificate for Patent No. 4,333,286, issued Jun. 8, 1982, Ser. No. 184,961, Sep. 8, 1980.
Continuation-in-part of Ser. No. 947,078, Sep. 29, 1978, Pat. No. 4,221,095, and Ser. No. 171,331, Jul. 23, 1980, Pat. No. 4,296,580, which is a continuation of Ser. No. 736,425, Oct. 28, 1976, Pat. No. 4,117,644.
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—281



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–11, 14, 15** and **22–30** is confirmed.

Claims **12, 16–19** and **31** are determined to be patentable as amended.

Claims **13, 20, 21** and **32–39**, dependent on an amended claim, are determined to be patentable.

1. A wall or partition comprising a substructure and a surface structure, said substructure including framing or supporting means for holding the surface structure, and said surface structure comprising first and second aligned substantially flat panels, adjacent at sides thereof, each of which has concealed major back, sides, top and bottom surfaces and a visible major front surface, which panels are substantially invisibly secured to the substructure and thereby are secured together or spaced apart a spacing distance by a first series of spaced apart concealed fastener clips appended to said first panel and to the substructure, and a second series of spaced apart concealed fastener clips appended to said second panel, so located as to avoid contact with any of said first series clips, and with a part of each of the panel contacting surfaces of each of the second series of clips contacting the major back surface of the first panel and spacing such surface from the framing or supporting means, with each of the clips of both said series being made from sheet or strip material and having spacing base portions, each of which is substantially coplanar and directly continuous, extending substantially parallel to said respective panels at concealed major back surfaces of said panels, with said spacing base portions each having, spaced apart, a substructure contacting surface on one side of the material thereof and a panel contacting surface on the other side, which spacing base portions space the major back panel surface from the framing or supporting means, which clip surfaces are spaced apart by

intermediate strengthening walls(s), a plurality of web portions extending from each of said base portions and between the adjacent first and second panel sides, and pointed tabs extending from said web portions, impaling a side of the panel to which the clip is appended, and wherein the clip fasteners of the second series of clips include reinforcing and lateral movement inhibiting indentations in web portions thereof.

B1 4,334,903 (531st)

OPTICAL FIBER FABRICATION

John B. MacChesney, Stirling, and Paul B. O'Connor, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Reexamination Request No. 90/000,811, Jul. 2, 1985.
Reexamination Certificate for Patent No. 4,334,903, issued Jun. 15, 1982, Ser. No. 117,522, Feb. 1, 1980.
Continuation of Ser. No. 828,617, Aug. 29, 1977, Pat. No. 4,217,027, which is a continuation of Ser. No. 444,705, Feb. 22, 1974, abandoned..
The portion of the term of this patent subsequent to Aug. 12, 1997, has been disclaimed.
Int. Cl.[4] C03B *37/018*
U.S. Cl. 65—3.12

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

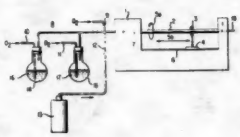
Claim 1 is determined to be patentable as amended.

Claims 2–8, dependent on an amended claim, are determined to be patentable.

1. A process for fabrication of an optical fiber transmission line comprising a core section and a cladding, wherein the cladding has an index of refraction of a value lower than the maximum index of the core for energy of the wavelength to be transmitted comprising:

introducing a moving stream of a vapor mixture including at least one compound glass-forming precursor together with an oxidizing medium into a tube while heating the tube so as to react the said mixture and produce a glassy deposit on the inner surface of the tube,

characterized in that the heating of tube and contents are by a moving hot zone produced by a correspondingly moving heat source external to the tube, and in that temperature within the hot zone, composition of the vapor mixture, and rate of introduction of the vapor mixture are maintained at values such that at least a part of the reaction takes place *as a homogeneous reaction* within the gaseous mixture at a position spaced from the inner walls of the said tube thereby producing a *visible* suspension of oxidic reaction product particulate material, which deposits on the inner surface of the tube and in that said particulate material is consolidated to produce said glassy deposit on the inner surface of the tube.



REISSUES

JULY 15, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

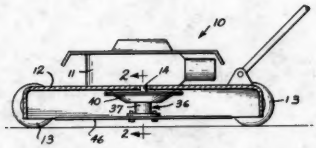
Re. 32,202
CENTRIFUGAL CLUTCH AND BRAKE FOR LAWN MOWER

John M. Cody, 1954 W. Sharon St.; William L. Weaks, 650 S. Virginia St., and John F. Cody, P.O. Box 613, all of Quincy, Fla. 32351

Original No. 4,369,616, dated Jan. 25, 1983, Ser. No. 200,825, Oct. 27, 1980. Application for reissue Jul. 8, 1983, Ser. No. 512,057

Int. Cl.[4] H01D *75/00*

U.S. Cl. 56—11.3 **9 Claims**



2. [A] *A lawn mower apparatus comprising a support housing having a deck, a power plant mounted on said deck, said power plant being operable at operating and idling speeds and having a drive shaft extending below said deck, a rotatably blade element disposed below said deck,* centrifugal clutch and brake [apparatus] *means* for selectively connecting [a] *said* power plant [mounted on a support and having a drive shaft,] to *said blade element,* [a rotatable driven element comprising] retainer means fixed to [the] *said* drive shaft [of the power plant], *said retainer means having flange means extending outwardly of said drive shaft,* [a plurality of weights] *weight means* slidably carried by said retainer means *so as to be movable outwardly with respect to said drive shaft,* return means connected to said [weights] *weight means* and urging said [weights] *weight means* toward the axis of said retainer means, said return means retracting said [weights] *weight means* when [the] *said* power plant is operated at idling speed and permitting said [weights] *weight means* to be extended by centrifugal action when [the] *said* power plant is operated at operating speed, each of said [weights] *weight means* having a first *tapered* frictional surface adjacent to the end which is remote from the axis of said retainer means, a housing mounted for rotational and axial movement on [the] *said* drive shaft of the power plant, said housing including [a] *first and second portions, said first* portion having a second frictional surface which is in spaced relationship with said first friction surface[, said housing having] *and a* first brake means, *said second frictional surface being of a configuration to permit a relative vertical movement between said first and second frictional surfaces as such surfaces engage one another, means for drivingly connecting said second portion of said housing to said blade element so that said blade element moves concurrently with said housing,* second brake means fixed to said [power plant support] *deck, said first and second brake means being vertically spaced from said first and second frictional surfaces,* means normally urging said first brake means into engagement with said second brake means, whereby when [the] *said* drive shaft of [the] *said* power plant is rotating at idling speed, said [weights] *weight means* are retracted into said retainer means and said first and second brake means are in engagement with each other and when the drive shaft is rotating at operating speed, said [weights] *weight means* are extended into engagement with said *second* frictional surface of said *first portion of said* housing and move said first brake means out of engagement with said second brake means and cause said housing to be rotated substantially at the speed of rotation of [the] *said* drive shaft.

Re. 32,203
PULPING WITH QUINONES AND HYDROQUINONES

Naphtali N. Vanderhoek, Doncaster; Peter F. Nelson, Kew, and Alan Farrington, Surrey Hills, all of Australia, assignors to Australian Paper Manufacturers Limited, South Melbourne, Australia

Original No. 4,213,821, dated Jul. 22, 1980, Ser. No. 800,566, May 25, 1977. Continuation of Ser. No. 505,739, Jun. 20, 1983, abandoned. Application for reissue Oct. 24, 1984, Ser. No. 664,226

Claims priority, application Australia, Jun. 2, 1976, PC6141; Sep. 23, 1976, PC7473; Dec. 13, 1976, PC8455

Int. Cl.[4] D21C *3/02, 3/22*

U.S. Cl. 162—72 **13 Claims**

1. In a process for the delignification of *softwood* lignocellulosic material wherein the *softwood* lignocellulosic material is cooked with a neutral sulphite pulping liquor, the improvement comprising adding to the pulping liquor 0.001% to 10% by weight of an additive compound selected from the group consisting of anthraquinone, phenanthrenequinone, naphthoquinone, anthrone, anthrahydroquinone, naphthohydroquinone, phenanthrahydroquinone, the alkyl-, alkoxy-, hydroxy-, amino-, halo- or carboxy derivatives of said quinones or hydroquinones, the tautomeric form of said additive compounds and mixtures of said additive compounds.

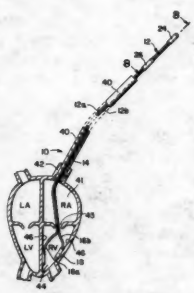
Re. 32,204
ELECTRODE ASSEMBLY FOR TEMPORARY PACING AND HEART MEASUREMENTS

Kenneth Halvorsen, San Clemente, Calif., assignor to Mansfield Scientific, Inc., Mansfield, Mass.

Original No. 4,289,138, dated Sep. 15, 1981, Ser. No. 157,504, Jun. 9, 1980. Application for reissue Jun. 1, 1983, Ser. No. 499,803

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—642 **13 Claims**



13. In an electrode assembly for insertion into the heart of a person via a catheter or the like for establishing an electrical connection between heart tissue and an electronic circuit, said assembly comprising at least two wire leads insulated from each other and carrying relatively large contact portions on their ends, said wire leads being slidable relative to said catheter, the improvement wherein

said wire leads are bound together in a manner providing discrete free distal end portions of fixed relative length,

said free end portions of said wire leads comprising oppositely bent springs that carry said relatively large contact portions, when residing within said cannular passage, said wire portions being temporarily straightened in a manner known per se by the confining walls of said cannular passage, and lying alongside one another,

the fixed lengths of the free end portions of said wires being of preselected, only slightly different length in a manner to stagger within the cannular passage the positions of the relatively large contact portions, thereby to enable said cannular passage to be of minimum diameter,

whereby said assembly can enter via a single cannular passage to position multiple wire leads within one cavity of the heart, and

said free end portion of said wires can spring apart to their original bent shape within said one heart chamber upon relative withdrawal of said cannular passage, thereby to enable stable contact of said contact portions at multiple positions within a relatively small region of the heart.

Re. 32,205

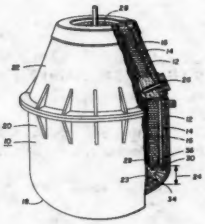
BASIC OXYGEN FURNACE CONSTRUCTION

Loren L. Kimmel, Chicago Heights, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 4,343,459, dated Aug. 10, 1982, Ser. No. 184,824, Sep. 8, 1980. Application for reissue Apr. 6, 1983, Ser. No. 482,387

Int. Cl.⁴ C21C *5/42*

U.S. Cl. 266—243 **4 Claims**



1. In an oxygen converter vessel, comprising a metal shell having a mouth at its top, a shell protective lining in contact with the inside surface thereof, and a working lining, said vessel constructed of three major zones, the bottom zone, the barrel zone, and the cone section zone, the three zones containing refractory brick having generally face, side and end surfaces, an end surface of each brick in these zones in the working lining being exposed to the interior of said vessel, the bottom zone being generally dish-shaped and of upwardly opening concave configuration, the brick in said zone terminating in a knuckle area with their face surfaces inclined from the vertical axis of the vessel, the barrel zone extending from the knuckle area upwardly to the cone section zone, the cone section zone being of downwardly opening truncated cross-sectional configuration, the improvement comprising a plurality of courses of refractory brick in the cone section zone, at the working lining, having a parallelogram cross-sectional configuration wherein opposed end surfaces of the shape are inclined with respect to the top and bottom surfaces. [and there are a pair of opposed acute angles and obtuse angles formed by the end surfaces and top and bottom surfaces.]

Re. 32,206

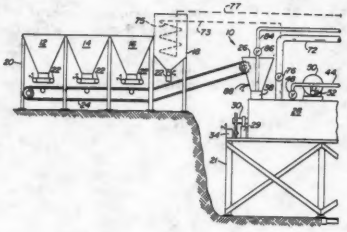
PROCESS FOR MAKING ASPHALT CONCRETE

Paul E. Bracegirdle, 559 Fairman La., Langhorne, Pa. 19047

Original No. 4,378,162, dated Mar. 29, 1983, Ser. No. 206,237, Nov. 12, 1980. Division of Ser. No. 13,931, Feb. 22, 1979, Pat. No. 4,245,915. Application for reissue Mar. 27, 1985, Ser. No. 716,719

Int. Cl.⁴ E01C *19/10*

U.S. Cl. 366—7 **20 Claims**



11. In a process for making asphalt concrete

(a) selectively sealing a mixture of starting materials including aggregate in a mixing chamber such that said mixture does not communicate with the atmosphere,

(b) indirectly heating said mixture while so sealed,

(c) evaporating some moisture from said mixture to form water vapor,

(d) condensing said water vapor by indirectly exchanging the heat in said water vapor to at least one of said starting materials which heats said starting material prior to the sealing of said mixture in said mixing chamber.

Re. 32,207

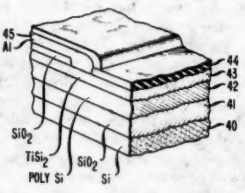
METHOD FOR MAKING INTEGRATED SEMICONDUCTOR CIRCUIT STRUCTURE WITH FORMATION OF TI OR TA SILICIDE

Hyman J. Levinstein, Berkeley Heights; Shyam P. Murarka, and Ashok K. Sinha, both of New Providence, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,332,839, dated Jun. 1, 1982, Ser. No. 227,133, Jan. 22, 1981. Division of Ser. No. 974,378, Dec. 24, 1978, Pat. No. 4,276,557. Application for reissue Sep. 30, 1982, Ser. No. 429,299

Int. Cl.⁴ H01L *21/283*

U.S. Cl. 427—85 **3 Claims**



1. A method for making a semiconductor device from a wafer including a silicon [epitaxial surface] layer, said method comprising the steps of heating the wafer in an oxidizing atmosphere for a time and at a temperature for forming a first SiO_2 overlay, forming a first layer of doped polysilicon over said SiO_2 layer, [depositing] *forming* on said polysilicon layer *in a sintering step* a second layer of a [material] *silicide* selected from the group consisting of [Ti and Ta sintering the material of said second layer at a temperature and for a time to form a silicide] $TiSi_2$ and $TaSi_2$ [of the material, respec-

tively,] *in a manner to avoid the formation of an oxide layer thereover,* heating the wafer for a time and at a temperature to form a second SiO_2 overlay while leaving a layer of polysilicon in excess of 1000 Angstroms therebeneath, etching a pattern in said second SiO_2 overlay, depositing an electrically-conducting material over said second SiO_2 overlay, and etching a pattern in said electrically-conducting material.

Re. 32,208

ABSORBABLE HEMOSTATIC COMPOSITION

Frank V. Mattei, Piscataway, N.J.; Martin Stephenson; Allin K. Gordon, both of Peterborough, Canada, and Namassivaya Doddi, Upland, Calif., assignors to Ethicon, Inc., Somerville, N.J.

Original No. 4,439,420, dated Mar. 27, 1984, Ser. No. 442,219, Nov. 16, 1982. Application for reissue Oct. 29, 1984, Ser. No. 665,552

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—78 **22 Claims**

1. An absorbable hemostatic composition for use in the control of osseous hemorrhage, comprising:

(i) a component (A) comprising either a biocompatible fatty acid salt alone, which comprises between 45% and 80% by weight based on the weight of the total composition; or a mixture of said fatty acid salt with a biocompatible in vivo absorption enhancing agent, in which said mixture comprises between 35% and 45% by weight of said fatty acid salt based on the weight of the total composition, and between 25% and 35% by weight of said absorption enhancing agent, based on the weight of the total composition; and *the remainder of the composition comprising*

(ii) a component (B) comprising a body absorbable biocompatible base selected from the group consisting of ethylene oxide [proplylene] *propylene* oxide block copolymers, polyethylene glycols and methoxypolyethylene glycols, triglycerides and fatty acid esters,

the cation of said fatty acid salt being selected from the group consisting of calcium, magnesium, zinc, aluminum, lithium and barium, the fatty acid anion being saturated or unsaturated and containing from 10 to 22 carbon atoms in the chain, said composition having a putty-like consistency at room temperature, and a tackiness sufficient for it to adhere readily to a bloody bone surface.

Re. 32,209

TELEVISION APPARATUS RESPONSIVE TO A TRANSMITTED COLOR REFERENCE SIGNAL

Peter S. Carnt, Herriliberg/Zurich, and George Schiess, Stallikon, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Original No. 3,673,320, dated Jun. 27, 1972, Ser. No. 121,842, Mar. 8, 1971. Application for reissue Jan. 24, 1977, Ser. No. 762,104

Claims priority, application United Kingdom, Mar. 11, 1970, 11687/70

Int. Cl.[4] H04N *9/68*

U.S. Cl. 358—27 **14 Claims**

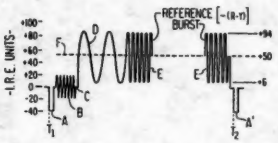
1. In a color television receiver adapted to receive a television signal including a luminance component, a chrominance component modulated in both phase and amplitude, periodically recurring color synchronizing bursts occupying prescribed intervals during the horizontal retrace portions of said signal and a color reference signal *fully* occupying a prescribed interval during the vertical retrace portion of said signal, apparatus comprising:

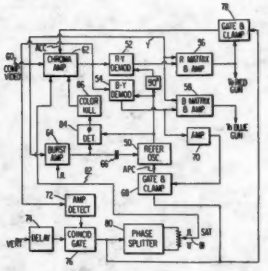
first means for providing an oscillatory signal to demodulate said chrominance component [and produce color difference signals containing information proportional to the hue and saturation of the televised scene]

second means including at least first and second chrominance signal demodulators responsive to said oscillatory signal, and also responsive to said television signal, for demodulating said chrominance component and producing color difference signal outputs representative of the hue and saturation of the televised scene, said reference signal being in quadrature phase relationship with respect to the demodulation axis associated with said first demodulator;

[second] *third* means responsive to said television signal for recovering the color synchronizing bursts thereof and for coupling said bursts to said first means to lock at least the frequency of the oscillatory signal provided thereby to the frequency of such bursts; and

[third] *fourth* means, also responsive to said television signal, for recovering said color reference signal and for utilizing said signal to develop a control signal for said first means to adjust the phase of said oscillatory signal as





a function of said reference signal, *said fourth means comprising the combination of (a) a frequency selective amplifier for delivering said chrominance and color reference signal components of said television signal to said demodulators, (b) said first demodulator, and (c) means for sensing the output of said first demodulator during the occurrence of said reference signal and deriving said control signal therefrom;*

whereby the degree of error in the hue of a reproduced color image attributable to such transmission characteristics as multipath, transmission line reflection and the like is correspondingly reduced[.]

wherein there is additionally included fifth means, responsive to said delivery of said color reference signal to said second demodulator via said amplifier, for controlling the amplitude of said color difference signals and the saturation of the reproduced color image as a function of departures of the amplitude of said delivered reference signal from a reference level responsive to the luminance component level exhibited during said prescribed interval.

PLANT PATENTS

GRANTED JULY 15, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,764
NEW ROSE PLANT

Samuel D. McGredy, 130 B Beach Rd., Castor Bay, Auckland 9, New Zealand

Filed Jun. 27, 1984, Ser. No. 625,032
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—25 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as shown and described, characterized particularly by unusual orange flowers borne in small clusters contrasting with attractive shiny foliage.

5,765
CARNATION NAMED BUGGIO

Giacomo Nobbio, Strada Villetta 5, San Remo, Imperia, Italy

Filed Apr. 16, 1984, Ser. No. 600,849
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized by its very large flower of basically yellow color and having petals bearing thin, longitudinal streaks of cyclamen red color, the flowers being very large and of a double type.

5,766
CARNATION NAMED MEI-FU

Giacomo Nobbio, Strada Villetta 5, San Remo, Imperia, Italy

Filed Apr. 16, 1984, Ser. No. 600,943
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of carnation, substantially as herein shown and described, characterized by its relatively small, double type flowers of symmetrical and flat shape, and by the several color tones on the upper surface of the flower petals which spread as on a fan, the petals also exhibiting an irregular corona pattern of color and a white reverse side which is overlaid by a faint pink coloration.

5,767
CARNATION NAMED CHINERA

Giacomo Nobbio, Strada Villetta 5, San Remo, Imperia, Italy

Filed Apr. 16, 1984, Ser. No. 600,942
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. The new and distinct carnation variety, substantially as herein shown and described, characterized by its very large light pink flowers of the double type and having a greater than normal number of petals of monochrome coloration and deeply laciniated margins.

PATENTS

GRANTED JUL. 15, 1986

ERRATA

For CLASS	See PATENT NO.
206–330	4,600,117
272–134	4,600,196
075–049	4,600,427
530–385	4,600,531
530–356	4,600,533
558–255	4,600,540
558–321	4,600,541
558–133	4,600,543
546–200	4,600,758

PATENTS

GRANTED JULY 15, 1986

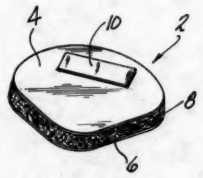
GENERAL AND MECHANICAL

4,599,746

EYELID SHIELD AND METHOD OF MAKING SAME

Claudia C. Stoner, 314 Three Mile Course, Guilford, Conn. 06437

Filed Oct. 29, 1984, Ser. No. 665,726
Int. Cl.[4] A61F *9/00, 13/12*
U.S. Cl. 2—15 **6 Claims**



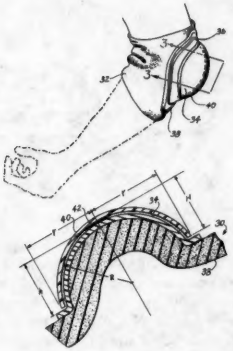
1. An eyelid shield for direct attachment to one's eyelid, said shield providing sufficient opacity to protect the wearer's eyelids during sunbathing, said shield comprising outer surfaces consisting of sheets of spunbonded moisture permeable polypropylene fibers, which sheets are smooth and non-linty, and a core layer of bulky fibrous material consisting of a mixture of wood pulp fibers and polypropylene fibers which core layer is highly moisture absorbant, said outer surface sheets allowing passage of moisture from the wearer's eyelids to said core layer, and from said core layer to the ambient atmosphere; and circumscribed adhesive means on one of said outer surface sheets for peelably securing said shield solely to one's eyelid.

4,599,747

BREAKDANCE APPAREL

Brian W. Robinson, 31 Ash La., Randolph, N.J. 07869

Filed Sep. 10, 1984, Ser. No. 648,748
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—16 **11 Claims**



1. Improved apparel to be worn during breakdancing for the purpose of facilitating body spinning and protecting the skeletal frame by distributing torsional and impact loads, when the skeletal frame spins or impacts the support structure, the improvement comprising:

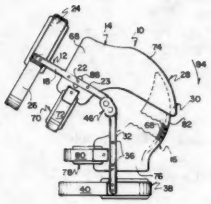
elements attached to the apparel which intercede between the skeletal frame and the support structure during breakdancing said elements having an external surface with a coefficient of friction low relative to the coefficient of friction of usual apparel and the naked body.

4,599,748

PROTECTIVE KNEE GUARD

Ruben C. Garcia, Corpus Christi, Tex., assignor to Francis R. Shearer, Corpus Christi, Tex., a part interest

Filed Mar. 22, 1985, Ser. No. 714,810
Int. Cl.[4] A41D *13/00, 13/06;* A61F *3/00*
U.S. Cl. 2—22 **14 Claims**



1. A protective knee guard comprising

a first rigid member providing a first arcuate guard portion for overlying a knee of a wearer;

a second rigid member providing a second arcuate guard portion for overlying the same knee of the wearer;

means for releasably attaching the first member to the leg of the wearer at a location above the knee;

means for releasably attaching the second member to the leg of the wearer at a location below the knee; and

means mounting the first and second members for relative pivotal movement between a first generally aligned position corresponding to a straight leg position of the wearer wherein the first and second arcuate guard portions are substantially nested over the knee and a second position wherein the members are inclined to each other corresponding to a bent leg position of the wearer wherein the first and second arcuate guard positions are substantially unnested, the mounting means comprises a link between the first and second members and means pivotally mounting the first and second members to the link for relative pivotal movement about a pair of spaced apart pivotal axes.

4,599,749

CAP FOR WOMEN TO CONCEAL HAIR LOSS

Margaret Childs, and Kathryn R. Costikyan, both of Northfield, Ill., assignors to Designs for Comfort, Inc., Northfield, Ill.

Filed Nov. 25, 1985, Ser. No. 801,301
Int. Cl.[4] A41G *5/00;* A42B *1/16, 1/24*
U.S. Cl. 2—199 **7 Claims**

1. A cap for wear by women to conceal hair loss comprising:

a main fabric piece with a periphery including a curved top margin and a straight bottom margin;

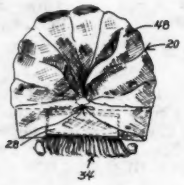
a bottom hem along the inside of the bottom margin to engage the wearer's forehead when worn;

a retainer band consisting of an elongated fabric strip centrally located along the inside of the bottom hem with opposite ends of the strip attached to the bottom hem to provide between itself and the bottom hem an upwardly and a downwardly open space, said retainer band not being visible from the outside when worn;

a hairpiece simulating bangs removably located in said space and projecting downwardly beyond the bottom hem;

a top hem along the inside of the curved top margin; and

a drawstring in the top hem effective when tightened to gather said curved top margin into a tight, multifolded loop at the lower nape of a wearer's neck to conceal the



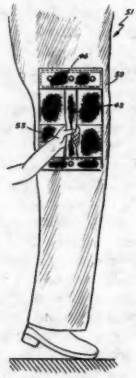
back of the head area and to provide multiple folds giving the appearance of a full head of hair while applying tension to the bottom hem and retainer band to retain the hairpiece in said space against the forehead.

4,599,750

HAND GRASPING MEMBER FOR A GARMENT

Abdul M. Rahaman, 3128 Garfield So., Minneapolis, Minn. 55408

Filed Aug. 7, 1985, Ser. No. 763,206
Int. Cl.[4] A41D *27/08, 27/20*
U.S. Cl. 2—243 R **2 Claims**



1. A hand holding attachment in connection with a garment, having in combination

a patch of material for attachment to a garment,

said patch comprises a plurality of layers forming pockets therebetween,

a flap at the top and bottom of said patch,

a strip of material extending between and under said flaps, and

means securing said strip to said flaps and said patch to provide an opening for a hand hold.

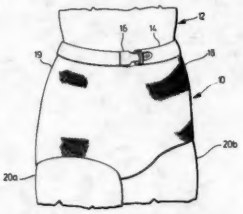
4,599,751

PROTECTIVE UNDERGARMENT

Harry E. Bouwhuis, Bowmanville, Canada, assignor to Bouwhuis Protective Undergarment Ltd., Bowmanville, Canada

Filed Sep. 19, 1984, Ser. No. 652,015
Claims priority, application Canada, Sep. 21, 1983, 437210
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—400 **4 Claims**

1. A protective undergarment for the lower torso of a wearer comprising: pants extending from the waist to the thighs and being relatively tight fitting to the thighs; a belt connected to the pants adjacent to the waist, both said pants and said belt being composed of flexible material resistent to manual tearing and to severance by a knife or like sharp object; means for fastening said belt selectively tightly about the waist, said belt when so maintained serving to prevent removal of



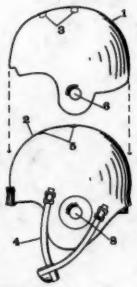
said pants from the lower torso, said belt when disposed loosely about the waist allowing removal of said pants from the lower torso; and a lock integral with said fastening means for causing said fastening means to maintain said belt tightly about the waist.

4,599,752

COMBINATION INTERLOCKING CAP FOR SPORTS' HELMET

Steven C. Mitchell, 27612 Soltero, Mission Viejo, Calif. 92691

Filed Jun. 21, 1984, Ser. No. 623,235
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—425 **9 Claims**



1. An improved interlocking cap for a helmet, comprising:

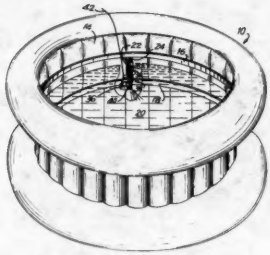
(a) a thin rigid plastic cap adapted for use as a conformable cover for the exterior surface of a helmet, the cap having a least a pair of male plugs projecting from the inside surface thereof adjacent the crown portion thereof, the pair of male plugs being disposed in spaced-apart relationship to one another, said plugs being adapted to interlockingly mate with corresponding, complementary receptacles in the helmet to prevent front-to-back movement therebetween, and further having a pair of ear hole plugs alignably adapted to be mated to the corresponding pair of ear holes in the helmet, which when mated therewith, said removably interlocking relationship prevents side-to-side movement therebetween.

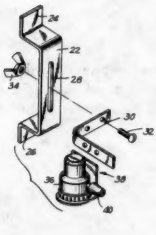
4,599,753

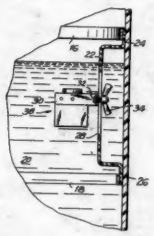
ASSEMBLY FOR UTILIZING BILGE PUMP AS POWER WATER JET

Steven Goodman, 85 Oak St., Norwood, N.J. 07648

Filed Aug. 12, 1985, Ser. No. 764,487
Int. Cl.[4] E04H 3/18; A47K 3/00
U.S. Cl. 4—559 5 Claims







1. Mounting means for utilizing a submersible bilge pump is a curved tub of water to function as a water jet, said curved tub having an inner wall, said mounting means comprising

carrier means for carrying said bilge pump,

a band disposed circumferentially inside said tube against said inner wall to which said carrier is attached,

said carrier being movable with respect to said band in a circumferential direction to adjust the circumferential position of said bilge pump,

said bilge pump having a spout end being attached to said carrier means,

said bilge pump being attached to said carrier means permitting vertical positioning of said bilge pump at a desired level in the water.

4,599,754

COMBINATION WIND SCREEN AND BEACH BLANKET APPARATUS

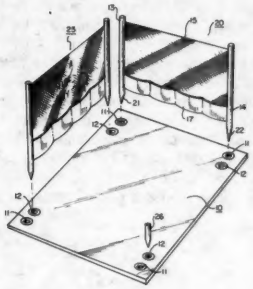
Robert W. Mairs, III, and Darra A. Mairs, both of 149 Marina Dr., Edison, N.J. 08817

Filed Oct. 9, 1984, Ser. No. 658,635
Int. Cl.[4] A45F 1/14; A47G 9/00
U.S. Cl. 5—418 10 Claims

1. The combination of a screen and blanket apparatus comprising:

a blanket having located on the surface thereof and in each corner an aperture of a given dimension,

a screen assembly having a right and left pole with each of said poles having pointed ends for insertion into corner apertures of said blanket, and having a flexible screen sheet assembly secured to said poles to form a relatively



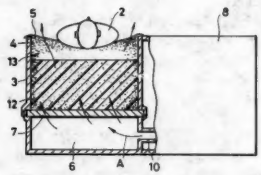
vertical wall when said ends of said poles are inserted into said apertures at opposing corners of said blanket.

4,599,755

BEAD FLUIDIZING TYPE BODY SUPPORTING DEVICE

Hiroshi Tominaga, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1984, Ser. No. 677,070
Claims priority, application Japan, Nov. 30, 1983, 58-225774
Int. Cl.[4] A61G 7/00; A47C 27/08
U.S. Cl. 5—453 5 Claims



1. A bead fluidizing type body supporting device comprising:

a vessel having a first portion vertically disposed above a second portion;

an open cell type porous elastic member in one of said first and said second portions;

beads in the other of said first and said second portions;

means for injecting air into said vessel to fluidize said beads therein; and

an air-permeable sheet covering the top of said vessel and adapted to support a body thereon in a floated state when said beads are in said fluidized condition.

4,599,756

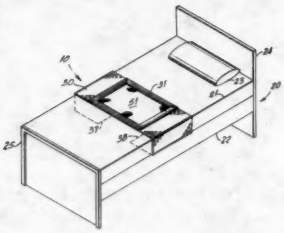
UNDERPAD HOLDER

Marshall N. Koffler, 8956 N.W. 9th Pl., Plantation, Fla. 33324

Continuation-in-part of Ser. No. 502,954, Jun. 10, 1983, abandoned. This application May 7, 1985, Ser. No. 731,456
Int. Cl.[4] A47G 9/00; A61G 7/06
U.S. Cl. 5—484 4 Claims

1. An underpad holder for use in combination with a disposable underpad and bedding mattress, said holder comprising, in combination, a plastic base sheet having a length longer than the width of a bed and mattress to which said base sheet is adapted to be applied tightly and with the opposite ends of said plastic base sheet folded around the side edges of the mattress and extending laterally inwardly below said mattress and be-

tween said mattress and support means provided on said bed to support said mattress, said plastic base sheet having a width extending lengthwise of said bed and mattress sufficient to cover a portion of the length of said bed likely to be soiled by an occupant of said bed, and a disposable underpad on said plastic base sheet, a single layer, continuous, thin, closed frame having a width extending transverse to the perimeter of said frame, said width defining an outer edge portion larger than said disposable underpad and an inner edge portion smaller than said disposable underpad, said outer edge portion having a pair of opposite outer side edges substantially coextensive with opposite outer side edges of a portion of said plastic base sheet disposed centrally of the lateral dimension of said bed and mattress and also having a pair of outer end edges extend-



ing transversely of said opposite outer side edges parallel to the opposite sides of said bed and mattress, means to bond said outer edge portion of said continuous frame to the upper surface of said plastic base sheet while keeping said inner edge portion of said continuous frame free of attachment or bonding to said plastic base sheet and to define a peripherally extending inwardly facing groove free of any interruption between the inner edge portion of said continuous frame and said plastic base sheet adapted to receive the entire perimeter portion of said disposable underpad including all corners of said perimeter portion in flat unwrinkled tucked relation within said peripherally extending groove and to remain in said tucked relation without requiring pinning between said underpad and said holder until such time as a conscious positive force is applied to remove said underpad from said tucked relation.

4,599,757

POLLEN TRAP

Vladimir Shaparew, 3371 Trafalgar Rd., R.R. #1, Oakville, Ontario, Canada L6J 4Z2

Filed Feb. 8, 1985, Ser. No. 699,802
Claims priority, application Canada, Feb. 27, 1984, 448352
Int. Cl.[4] A01K *47/06*
U.S. Cl. 6—4 R **7 Claims**

1. Pollen trap for a beehive, comprising:

a rectangular frame, which is dimensioned to fit as a section in a beehive, the frame having front, back, and two side members, and being open at the top and bottom;

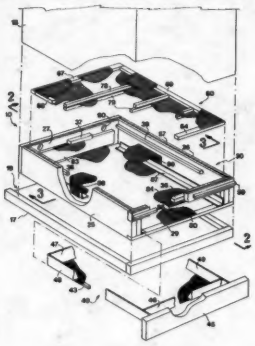
a pollen-stripper screen, having at least one layer of a mesh that is coarse enough that bees can pass through the mesh, yet fine enough to dislodge granules of pollen from bees passing through the mesh, the screen being fitted to the open top of the frame in such a way that bees cannot pass from within the frame to above the frame except through the mesh;

a pollen basket for collecting the pollen granules dislodged from the bees, the pollen basket having a bottom of fine mesh through which air can circulate;

wherein the pollen basket is enclosed in a sheath which is impervious to bees, so that bees are kept from contact with the pollen basket, the sheath being not open to the inside of the hive;

wherein the sheath has a mouth that is open to the outside of the hive to allow the pollen basket to be inserted into the sheath and withdrawn from it;

wherein at least the roof of the sheath over the pollen basket is of a mesh that is coarse enough that granules of pollen can fall through the mesh yet fine enough that bees cannot get through the mesh;



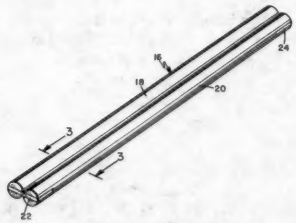
and wherein a space is provided between a side of the sheath and the side piece of the frame adjacent to it, of a width that allows bees to pass through the space from below the sheath to above it.

4,599,758

PLIABLE CONTAINER OPENING AND EMPTYING DEVICE

Robert G. Stiles, 2003 Bayview Heights Dr., Sp. 194, San Diego, Calif. 92106

Continuation-in-part of Ser. No. 532,798, Sep. 16, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 683,626
Int. Cl.[4] B65D *35/28*
U.S. Cl. 7—158 **7 Claims**



1. A pliable container opening and emptying device comprising:

an elongated member having a longitudinal slot with confronting surfaces for emptying the content of an open container when the container is drawn between said confronting surfaces;

at least one cutting blade mounted in said member and extending between said confronting surfaces for opening a container by drawing the container against said blade.

4,599,759

TRANSFER APPARATUS

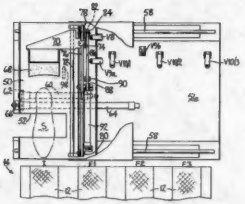
Frank C. Price, Leicester, and Anthony M. White, Oadby, both of England, assignors to USM Corporation, Farmington, Conn.

Filed May 31, 1984, Ser. No. 615,918

Claims priority, application United Kingdom, Jun. 10, 1983, 8315953

Int. Cl.[4] A43D *11/00*; B65G *47/02*

U.S. Cl. 12—1 A 3 Claims



1. An apparatus for heat setting lasted shoe uppers comprising:

a heat setting machine including a plurality of parallel channels for receiving a corresponding plurality of lasted shoe uppers, and

a lasted shoe distributor including

means for supporting a lasted shoe upper in line with one of said channels, said supporting means comprising a surface for supporting the heel portion of a supported lasted shoe upper and a surface for supporting the toe portion of a supported lasted shoe upper with an opening between said surface so that the portion of the supported lasted shoe upper between the toe and heel portions is unsupported whereby pick and place machinery can extend through the opening when placing a shoe upper on or picking up a shoe upper from said supporting surface, and

means for displacing said supporting means to selectively locate the supported lasted shoe upper in line with each of the other channels, and

means for pushing the supported lasted shoe upper into the channel with which it is aligned.

4,599,760

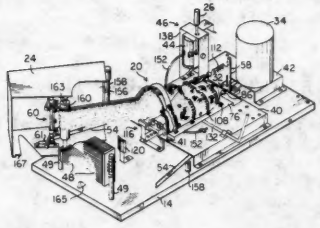
SHOE BUFFING MACHINE

John Thomas, 2615 S. Calhoun Rd.—Apt. #108, Bldg. 4, New Berlin, Wis. 53151

Filed Jan. 3, 1984, Ser. No. 567,505

Int. Cl.[4] A47L *23/02*

U.S. Cl. 15—31 10 Claims



1. A shoe buffing machine comprising

a base structure,

a shoe buff member shaped to at least partially enclose a shoe,

means supporting said buff member on said base structure, a shoe support located on said base structure in a position to support a shoe inserted into said buff member,

drive means operatively connected to vibrate at least one of said supporting means and said shoe support whereby a shoe placed in said buff member on said shoe support is buffed by the relative motion of said support means with respect to said shoe support, and

means mounted on said base structure for applying shoe conditioning preparation to said buff member

wherein said applying means comprises

a bracket mounted on said base structure,

a container holder pivotally mounted on said bracket,

button means for rotating said holder to mix the content of said container, and

actuating means for actuating the nozzle on said container on rotary movement of said holder in said bracket.

4,599,761

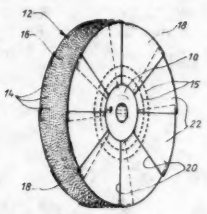
POLISHING DISK

Helmut Stahl, Bergle 5, 7205 Böttingen, Fed. Rep. of Germany

Filed Jan. 7, 1985, Ser. No. 689,066

Int. Cl.[4] B24B *29/00*

U.S. Cl. 15—230.12 12 Claims



1. A polishing disk comprising

a rigid carrier ring; and

a yieldable layer of textile material attached to the periphery of the carrier ring, said yieldable layer including a multiplicity of individual threads distributed over the periphery of said carrier ring, each thread having a diameter in the range from about 0.02 mm to about 1 mm, and a free end of a length of at least 10 cm, said individual threads including a proportion of particle-repelling synthetic fibers including polyester fibers, the remaining individual threads containing cotton or wool, and wherein the proportion of synthetic fibers in respective individual threads steadily increases from one side of the disk to another side of the disk, said free ends extending substantially radially outwardly when acted upon by a centrifugal force, said centrifugal force arising from said carrier ring being rapidly rotated, the free ends of said threads being adapted to impinge on the surface of a workpiece, and to roll off therefrom, and wherein, upon the disk being rotated, the workpiece is adapted to enter one side of the disk, to pass through said yieldable layer, and to exit from the other side of said disk.

4,599,762

PAINT APPLICATOR

Steven M. Rigter, 115 Townson Avenue, Palm Beach, 4221 Queensland, Australia

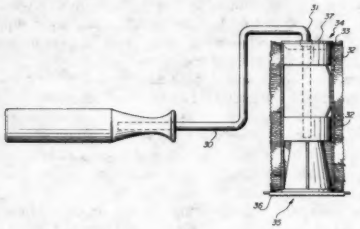
Filed May 17, 1984, Ser. No. 611,465

Int. Cl.[4] B05C *17/02*

U.S. Cl. 15—248 A 8 Claims

1. A shield device mountable relative to a roller of a roller applicator for enabling the applicator to be used to apply a

liquid to one surface of a pair of intersecting surfaces so as to provide a continuous sharp cut in line at the intersection of the surfaces, said device including shielding means, one edge of which forms a contact edge which, in use, touches the surface to which the liquid is applied, said contact edge has a rebate



portion extending along it on the side of the shielding means opposite the roller, and resilient mounting means for securing the shielding means to the roller whereby in use the roller may be pressed against the one surface without disturbing the contact of the contact edge with the one surface.

4,599,763

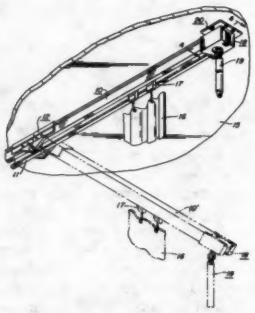
HINGED CEILING TRACK

Ellis I. Toder, 341 Militia Hill Rd., Fort Washington, Pa. 19034

Filed Aug. 3, 1984, Ser. No. 637,301

Int. Cl.[4] E05D *15/06*

U.S. Cl. 16—94 D **14 Claims**



1. A latching track system comprising in combination

(a) a first track section fixable in position to a supporting surface,

(b) a second track section downwardly swingable with respect to and being a continuation of said first track section, said second track section having a hinge connection at one end to the said fixable position first track section, and having a free end at the end remote from the hinge connection,

(c) a track latching mechanism having,

(1) a first section fixedly secured to the said free end of the said swingable track, and

(2) a second section fixedly securable to a supporting surface,

said first and second track latching sections being releasably interlatchable with one another, and

(d) remotely operable rotatable actuating means engagable with said track latching mechanism, and effective for latching and unlatching said mechanism to respectively secure the said free end of said swingable track section to its associated supporting surface and to release it therefrom by rotation thereof, said remotely operable actuating means being directly engagable with both of said first and second sections of said track latching mechanism when rotating to latch and unlatch said mechanism.

4,599,764

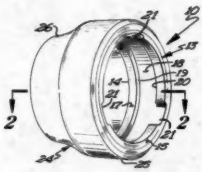
CASING RING DEVICE

Thomas R. Knepshield, Kenosha, Wis., assignor to Vista International Packaging, Inc., Kenosha, Wis.

Filed Aug. 3, 1984, Ser. No. 637,481

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—41 **1 Claim**



1. A ring device adapted to be mounted adjacent the discharge end of a stuffing horn for a stuffing machine used to stuff casings with food product and over which the casing passes, the stuffing horn having circumferentially spaced apart locking lugs projecting outwardly therefrom, a snubbing device for applying clips to the casing and having a rigid annular brake ring through which the stuffing horn projects during the stuffing operation, comprising:

a ring member having a front end and a rear end and being formed of a metallic material, said ring member having a generally circular interior surface, an enlarged interior annular recess in said interior surface spaced from the front and rear ends thereof to define front and rear annular shoulders, a plurality of circumferentially spaced apart slots in said front shoulder communicating with said annular recess to permit the slots to pass over the locking lugs on the stuffing horn whereby, when the ring is rotated, the ring device will be releasably locked on the stuffing horn,

a sleeve formed of flexible yieldable material and including a ring member engaging portion and a forward portion, said ring member engaging portion embracing the exterior surface of said ring member and said forward portion extending axially forwardly from said ring member and said ring member engaging portion, the exterior surface of said forward portion tapering axially from said ring member and ring member engaging portion, and the interior surface of said forward portion having a diameter corresponding generally to the inner diameter of said ring member, said ring member engaging portion of said sleeve having an exterior diameter less than the diameter of the casing to be filled whereby the casing being moved over said ring device and through the brake ring during the stuffing operation will be retarded by the yieldable sleeve as the sleeve yieldably urges the casing against the brake ring during the stuffing operation.

4,599,765

DEVICE FOR DECAPITATING FISH BY A CUTTING ACTION

Sigurdur Kristinsson, Mávahlíd 11, Saudarkrókur, Iceland

Filed Aug. 29, 1983, Ser. No. 527,182

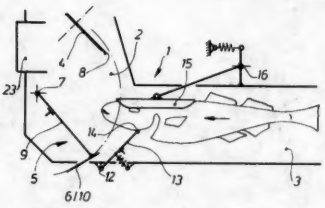
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233747

Int. Cl.[4] A22C *25/14*

U.S. Cl. 17—63 **16 Claims**

1. A device for processing fish having its throat opened and defining a head end and a tail end with flank sides and a belly therebetween by means of a cutting decapitation action, said device comprising support surface means for the fish to be

processed, cutting means for performing said decapitating cut in a cutting plane, and conveyor means carrying entraining means for moving said fish against said cutting means in said cutting plane, wherein said support surface means are arranged to receive said fish resting on one of its sides and said head end leading, wherein pin-shaped support means extending approximately perpendicular to said support surface means are arranged to engage said fish at the base of said opened throat and to guide and hold said fish in a position in which said opened



throat is located to be engaged by said entraining means, wherein said entraining means are driven to pivot in a controlled manner about an axis essentially perpendicular to said support surface means, to engage said opened throat from the side of said belly during said pivoting motion and to entrain said fish in a guided manner against said cutting means in continuation of said pivoting movement, and wherein said cutting plane is arranged essentially perpendicular to said support surface means and tangential to the path of said entraining means.

4,599,766

METHOD AND APPARATUS FOR FORMING A MORE EVEN WEB FROM STAPLE FIBERS

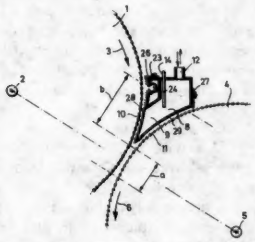
Walter Wirth, Duelmen, Fed. Rep. of Germany, assignor to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany

Filed Dec. 21, 1984, Ser. No. 684,877

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1983, 3346335

Int. Cl.[4] D01G *15/46*

U.S. Cl. 19—106 R **20 Claims**



1. In a method for forming a random fibrous web from staple fibers, including disentangling the constitutent fibers of fibrous flock and forming a web thereof wherein said fibers are aligned substantially axially parallel one another through a carding action, and then randomizing the axial orientation of the fibers to provide a more isotropic web structure by means of centrifugal, aerodynamic web formation wherein carded fibers are moved through a zone in the form of a progressively narrowing slot about the arcuate surface of a toothed cylinder and then are propelled into free flight therefrom and onto the surface of a receiving means in a pattern of axial randomized orientation of the contituent fibers, the improvement comprising

a. sensing the gas pressures extant at said zone,

b. comparing said pressures with a predetermined pressure value, and

c. adjusting said pressures in such a manner that they are changed to approach said predetermined pressure value at said zone.

4,599,767

SWIVEL SNAP HOOK OF SYNTHETIC RESIN AND METHOD OF MANUFACTURING THE SAME

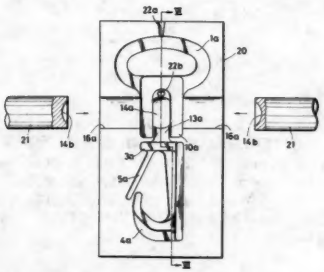
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,724

Claims priority, application Japan, Apr. 10, 1984, 59-71401

Int. Cl.[4] A44B *13/02*; F16G *17/00*

U.S. Cl. 24—236 **4 Claims**



1. A method of manufacturing a swivel snap hook of synthetic resin, the hook including an eye member, a hook member, and means connecting the eye and hook member for pivotal movements relative to each other, the hook member having a base, a hook body extending from one side of the base, and a closure tongue extending from the one side of the base, the connecting means including a bearing portion extending from one of the eye and hook members and being divided into a pair of opposed bearing halves by a space, the bearing halves having a pair of aligned through-holes of circular cross section communicating with the space, the connecting means also including an arm portion extending from the other member into the space and terminating in an enlarged end loosely received in the through-holes in the bearing halves across the space, said method comprising the steps of:

(a) providing a mold defining a mold cavity of a contour corresponding to the shape of the eye and hook members in coupled state, said mold including a pair of identical molding die halves, and a pair of identical associated cylindrical rods, and said molding die halves having a pair of symmetrical first recesses for forming the eye member, a pair of symmetrical second recesses for forming the bearing portion, a pair of symmetrical third recesses for forming the base of the hook member, a pair of symmetrical fourth recesses for forming the hook body, a pair of symmetrical fifth recesses for forming the closure tongue, a pair of symmetrical sixth recesses for forming the arm portion, and a pair of symmetrical seventh recesses for forming a central part of the enlarged end, each of said cylindrical rods having in its one end an eighth recess for forming a respective one of a pair of opposite remaining parts of the enlarged end, said molding die halves further having two pairs of ninth recesses each having a semi-cylindrical contour, two of said semicylindrical ninth recesses in one molding die half being longitudinally aligned with each other and being disposed in mirror image relation to the other two semi-cylindrical ninth recesses, respectively, in the other molding die half, each symmet-

rical pair of said semi-cylindrical ninth recesses lying perpendicularly to said second recesses and jointly defining a cylindrical contour for receiving a respective one of said cylindrical rods;

(b) closing said mold in such a manner that each of said first, second, third, fourth, sixth, seventh, eighth and ninth recesses in said one molding die half is in registry with a respective one of the corresponding recesses in said other molding die half, said closing including inserting each said cylindrical rod inserted through each said symmetrical pair of said semi-cylindrical ninth recesses perpendicularly to said second recesses until said one end of each said cylindrical rod reaches said seventh recesses;

(c) injecting an amount of heat-softened thermoplastic synthetic resin into said closed mold to fill the mold cavity; and

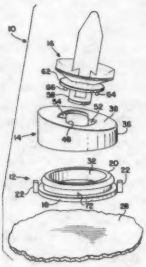
(d) after said heat-softened synthetic resin in the mold cavity is cooled to become hard, removing from said mold the eye and hook members molded in coupled state.

4,599,768

SPIN WELDED FASTENING ASSEMBLY

Beryle S. Doyle, Howell, Mich., and Brian R. Peek, Steger, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 13, 1985, Ser. No. 733,343
Int. Cl.[4] A41F *1/00*; F16B *21/00*
U.S. Cl. 24—590 **2 Claims**



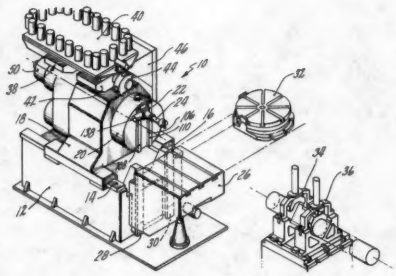
1. A spin welded fastening assembly comprising a circular base member formed of thermoplastic material, means for rotating said base member to cause its bottom surface to be spin welded to a substrate, a standoff member having a circumferential flange portion of a diameter slightly larger than the diameter of siad base member and having an integral mounting plate portion extending transversely relative to said flange portion, means for connecting said flange portion onto said base member in a manner to permit said standoff member to be rotated about said base member in one direction only said means for connecting said flange portion onto said base member includes a plurality teeth formed around one of said flange portion and said base member with the teeth pointing towards said one rotative direction to permit a ratcheting action, said mounting plate portion having a mounting aperture formed therethrough, a fastener member having a head portion and a shank portion, and means for mounting said head portion of said fastener member in said mounting aperture of said mounting plate portion with a rotative action to firmly capture said head portion, the direction of said rotative action being opposite to said one direction of rotation permitted by said means for connecting said flange portion onto said base member.

4,599,769

MACHINE WITH ROTATING CUTTING TOOL

Richard I. Latzko, Glastonbury; George H. Marsland, Bristol, and Johann F. Reuteler, West Hartford, all of Conn., assignors to Colt Industries Operating Corp, West Hartford, Conn.

Continuation of Ser. No. 405,434, Aug. 5, 1982, abandoned. This application Mar. 12, 1985, Ser. No. 709,996
Int. Cl.[4] B23B *30/02, 3/26*; B23C *9/00*
U.S. Cl. 29—26 A **18 Claims**



1. An improved machine tool with a rotating cutting tool of the type having a headstock, a spindle mounted for rotation about an axis in the headstock; a position transducer operatively connected to the spindle for generating a pulse frequency indicative of the actual RPM thereof relative to the headstock; wherein the improvement comprises:

a machining head integral with the spindle;

a precision drive screw mounted for rotation in the machining head with its axis extending radially of the spindle axis;

a radial slide mounted upon the drive screw in threaded engagement therewith for radial movement in response to rotation of the drive screw about its axis, the radial slide being adapted to receive the cutting tool;

a threaded shaft mounted for rotation in the machining head in driving connection with the drive screw and having a threaded section;

a counterbalance block mounted upon the threaded section of the threaded shaft in threaded engagement therewith such that when the drive screw is rotated opposite radial movements of the radial slide and the block are produced;

a drive shaft extending through the spindle in driving connection with the drive screw such that rotation of the drive shaft relative to the spindle produces rotation of the drive screw about its axis;

a servo motor, having a shaft, fixedly mounted upon the spindle for rotation therewith and having its shaft in driving connection with the drive shaft for producing drive shaft rotation relative to spindle;

a position transducer operatively connected to the servo motor for generating a pulse frequency indicative of the actual RPM of the shaft of the servo motor relative to the headstock; and

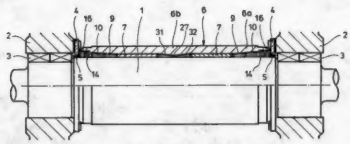
a numerical controller operatively connected to the position transducers and having means for generating a command signal indicative of the desired RPM of the shaft of the servo motor relative to the spindle, means for generating a first signal indicative of the actual RPM of the shaft of the servo motor relative to the headstock, means for generating a second signal indicative of the actual RPM of the spindle relative to the headstock, means to substract the first signal from the sum of the command signal and the second signal for producting a velocity error signal and means to integrate the velocity error signal to provide a position error signal.

4,599,770

ROLL FOR ROLLING MILL

Heiji Kato, and Hiroyuki Shiozaki, both of Yokosuka, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 6, 1984, Ser. No. 597,260
Int. Cl.[4] B21B *31/16, 27/02*
U.S. Cl. 29—113 R 2 Claims



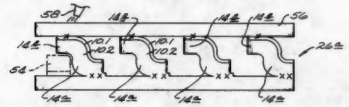
1. A roll used in a rolling mill comprising a roll core, a sleeve fitted over the length of said roll core, means defining a liquid-tight chamber between an end portion of said roll core and an end portion of said sleeve, said liquid-tight chamber having opposing surfaces, at least one of the opposing surfaces of said liquid-tight chamber being tapered, an axially movable tapered ring interposed between the opposing surfaces of said liquid-tight chamber, and means connected with said liquid-tight chamber for forcing a liquid therein for moving said tapered ring axially toward the center portions of said roll core and sleeve so that the end portion of said sleeve is radially expanded, whereby the roll profile is varied.

4,599,771

METHOD OF MAKING A STIFFENED COMPOSITE METAL PANEL

George Trenkler, East Providence, R.I.; Richard Delagi, Sharon, Mass.; Charles Britton, S. Easton, Mass., and Robert J. Schwensfeir, Jr., Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 21, 1985, Ser. No. 703,782
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—155 R 3 Claims



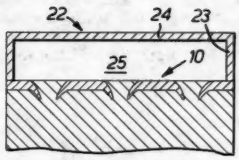
1. A method for making a stiffened composite metal panel member comprising the steps of forming a plurality of relatively narrow grooves extending in spaced side-by-side parallel relation to each other in a first layer of metal, the grooves having depths less than the thickness of the first metal layer for defining separable strips of the first metal layer, arranging a plurality of stripes of bond-preventing material in spaced side-by-side parallel relation to each other between the first metal layer and a second layer of metal, the stripes extending parallel to the grooves and having widths and spacings selected relative to the spacing of the grooves so that a stripe of bond-preventing material extends between the second metal layer and a first portion of each of said separable strips of the first metal layer extending along one edge of the strip leaving a second portion of each strip extending along an opposite edge of the strip free of such bond-preventing material, pressing the metal layers together with reduction in thickness thereof for metallurgically bonding said second portions of each of the separable strips to the second metal layer to form a composite metal panel while leaving said first portions of each separable strip free of such bonds, separating said separable strips of the first metal layer from each other along the grooves and bending said first strip portions away from the second metal layer to form precisely located stiffening ribs in the composite metal panel, folding a distal edge of each of the stiffening ribs for forming a flange along said distal edge, and securing a third layer of metal to said flanges.

4,599,772

METHOD FOR REINFORCEMENT OF PISTONS OF ALUMINUM OR ALUMINUM ALLOY

Neil A. Graham, Chard, England, assignor to AE PLC, Warwickshire, England

Filed Feb. 3, 1984, Ser. No. 576,556
Claims priority, application United Kingdom, Feb. 4, 1983, 8303108; Oct. 2, 1983, 8328116
Int. Cl.[4] B23P *15/10;* B22D *19/00, 27/09, 27/11*
U.S. Cl. 29—156.5 R 4 Claims



1. A method of reinforcing a crown of an aluminium or aluminium alloy piston for an internal combustion engine, the method comprising:

forming a crown reinforcement member in the shape of a flat disc of ferrous material,

punching holes in said reinforcement member so that the material of the reinforcement forms a downwardly converging annular flange around each hole,

inserting said punched disc member into a crown-forming part of a piston die, with said flanges projecting upwardly,

filling the die with molten aluminium or aluminium alloy, and then

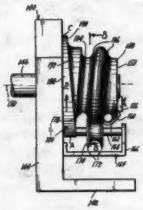
solidifying the molten aluminium or aluminium alloy under pressure, whereby the aluminium or aluminium alloy is forced into said holes and, on solidification, forms an interlock with the reinforcement member to connect the reinforcement to the aluminium or aluminium alloy.

4,599,773

METHOD OF FORMING A MULTIPLE COIL HEAT EXCHANGER

Richard W. Sievers, South Windsor, Conn., assignor to Thermodynetics Inc., Windsor, Conn.

Division of Ser. No. 141,894, Apr. 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 83,568, Oct. 11, 1979, abandoned. This application Sep. 20, 1982, Ser. No. 420,599
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 R 1 Claim



1. A method of forming a heat exchanger from a generally straight longitudinal heat exchange tube enclosing an inner tube comprising the steps of mounting one end of the heat exchanger tube to one axial end of a threaded rotatable die

having a screw thread with a root sized to receive said heat exchange tube at said one axial end with at least partial circumferential support therefor; rotating said die in one direction to wind the heat exchange tube onto the thread of the die to form a plurality of turns of an inner coil of said heat exchange tube; upon completion of said inner coil continuing to rotate said die in said one direction while wedging said heat exchange tube radially outwardly and subsequently axially towards said one axial end of the die to commence a first turn of a second coil concentric with and over the inner coil; and, continuing to rotate the die in said one direction to bend said heat exchange tube and form said second coils with a plurality of turns.

4,599,774

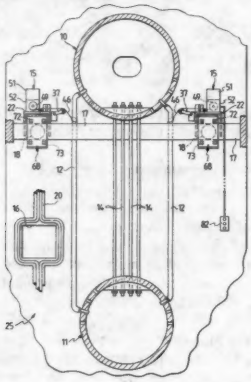
BOILER TUBE STABBING APPARATUS

Samuel B. Till, Jr., Rte. 1, Box 104, Greenville, Ala. 36037

Filed Sep. 3, 1985, Ser. No. 772,156

Int. Cl.[4] B21D *53/00*; B23P *15/26*

U.S. Cl. 29—157.4 **11 Claims**



1. Apparatus for replacing tubes in a multiple-drum bent-tube bolier having at least a steam drum and a mud drum comprising:

(a) hoist means located externally of said steam drum and mud drum for raising one end of each of said tubes into cooperative alignment with said steam drum;

(b) carraige means for moving said hoist means and any tube supported thereby along a line parallel to the longitudinal axis of said steam drum and externally thereof; and

(c) positioning means for moving said carriage means relative to the exterior of said steam drum in a plane passing through said parallel line.

4,599,775

METHOD FOR MANUFACTURING SYNCHRONIZER CLUTCH TEETH

Josef Büscher, Pulheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 10, 1985, Ser. No. 690,277

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408065

Int. Cl.[4] B21D *53/28*

U.S. Cl. 29—159.2 **2 Claims**

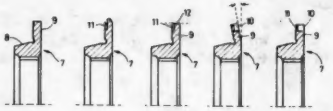
1. A method for making clutching teeth having crown bevels and rear cut sections on a part of a synchronizer clutch comprising:

fine stamping the crown bevels on a face of the part;

removing material from the circumference of the part;

bending the part through an angle corresponding to the angle at which the rear cut sections are to be inclined with respect to an axis of the part,

punch cutting the clutching teeth; and



bending the part back into substantial alignment with the plane from which it was previously bent.

4,599,776

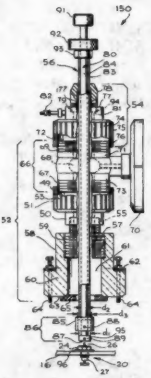
ELEMENT REMOVAL TOOL FOR SYSTEM CARRYING FLUID UNDER PRESSURE

Eugene E. Haggard, 4259 N. Jerry Ave., Baldwin Park, Calif. 91706; John A. Correa, 3780 W. 177th St., Torrance, Calif. 90504; Terrell M. Keene, 808 S. Bradfield Ave., Compton, Calif. 90221; Wiley C. Calhoun, 13739 Mc Nab St., Bellflower, Calif. 90706; Edgar J. Flemming, 5742 S. Van Ness St., Los Angeles, Calif. 90062; David L. Taylor, 11249 Hulme Ave., Lynwood, Calif. 90262; Richard N. Hartley, 11600 Hollyview Dr., La Mirada, Calif. 90638; Francisco J. Martinez, 8348 Terradell St., Pico Rivera, Calif. 90660, and Rudy A. Lopez, 10235 Hunt, Southgate, Calif. 90280

Filed Oct. 22, 1984, Ser. No. 663,564

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—213 R **10 Claims**



1. A tool for replacing an axle box in a member such as a meter, or the like, in a gas distribution system carrying gas under pressure, such axle box having a mounting flange and a rotatable axle carried thereby, said member having a flat surface carrying said axle box, said flat surface having threaded openings proximate to the periphery thereof;

a base sealing portion including a first pipe having first and second ends, said first end carrying threads and said second end carrying a flange;

said flange on said second end of said first pipe having openings therein for passing threaded bolts therethrough, to engage corresponding threaded openings in said flat surface for securing said flange directly to said member;

a gate valve included in said base sealing portion intermediate its first and second ends for controlling the flow of gas through said first pipe;

a stuffing box portion having a second pipe with first and second ends and an inner space, said first end of said second pipe carrying a threaded element with threads

sized and pitched to cooperate with said threads carried by said first end of said first pipe;

said stuffing box portion including a release valve communicating with the inner space of said second pipe and a stuffing collar carried by said second end of said second pipe;

said stuffing collar having an axial opening therethrough with a first diameter;

an element-removal portion including a hollow outer shaft having first and second ends, a first outer diameter and a first inner diameter and a concentric inner shaft having first and second ends, and a second outer diameter, said concentric inner shaft being axially rotatable within and with respect to said hollow outer shaft;

an outer socket affixed to said first end of said hollow outer shaft and adapted to engage firmly said mounting flange of said axle box;

an inner socket fixedly carried by said first end of said concentric inner shaft for operationally engaging said rotatable axle of said axle box;

a handle carried by said second end of said concentric inner shaft and torque-application means carried by said second end of said hollow outer shaft;

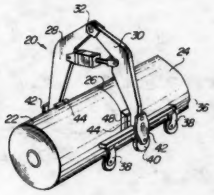
said first outer diameter of said hollow outer shaft being such as to permit relative rotational but hermetically sealing engagement between said stuffing collar and said hollow outer shaft.

4,599,777

APPARATUS FOR SEPARATING ROLLS WHICH ARE INTERCONNECTED END-TO-END

James R. Michler, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Jun. 14, 1985, Ser. No. 744,676
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—239 **5 Claims**



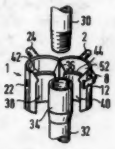
1. Apparatus for separating a pair of rolls of sheet material stuck-together end-to-end along a juncture therebetween, comprising a pair of wedges; means for supporting said wedges on opposite sides of the rolls in alignment with the juncture therebetween; and drive means coupled to said supporting means for moving the same and said wedges to forcefully move said wedges into the juncture between the rolls on opposite sides thereof to separate the rolls one from the other, wherein said supporting means comprises a pair of generally vertically extending arms pivotally interconnected towards upper ends thereof, each said arm carrying a respective one of said wedges toward a lower end thereof and said arms being adapted to straddle the rolls to position said wedges on opposite sides of the rolls in alignment with the juncture therebetween, said drive means is coupled to said arms for pivoting the same relative to each other to forcefully move said wedges into the juncture between the rolls, and including wheeled transport means coupled with said lower ends of said arms for carrying said arms, wedges and drive means and for enabling the same to be conveniently rolled from one position to another.

4,599,778

INSTALLING OR CENTERING MECHANISM FOR PIPES TO BE SCREWED INTO ONE ANOTHER

Wilfried Dreyfuss, Dortstrasse 52, D-3111 Eimke, Fed. Rep. of Germany; Thomas E. Remp, 5555 Del Monte Dr., Houston, Tex. 77056, and Kurt Müller, Eicklingen, Fed. Rep. of Germany, assignors to Wilfried Dreyfuss, Eimke, Fed. Rep. of Germany and Thomas E. Remp, Houston, Tex.

Filed Apr. 30, 1984, Ser. No. 643,476
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1983, 3315752; Sep. 3, 1983, 3331867
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—272 **19 Claims**



1. An inserting and centering for associated screw-in pipes, comprising:

(a) first and second semi-cylindrical jaws, each of said jaws has a first end portion and a second end portion;

(b) means associated with said first end portions articulatably connecting said jaws;

(c) each of said jaws has an inside surface, including an annular projection for resting on the socket edge of a pipe and further including a conical flaring portion extending from an upper end of each projection;

(d) closure means associated with said second end portions for locking said jaws together in a closed position; and,

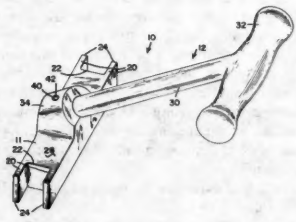
(e) handle means mounted to one of said jaws and operably associated with said closure means for unlocking said closure means.

4,599,779

CONSTRUCTION TOOL

Eric Thibault, 15 Lake Pkwy., Webster, Mass. 01570

Filed Sep. 30, 1983, Ser. No. 537,801
Int. Cl.[4] E04G *21/16*
U.S. Cl. 29—283 **9 Claims**



1. Construction tool for metal framing elements having a generally U-shaped cross-sectional configuration consisting of a bottom wall and two side walls with the side walls being substantially parallel with each other and the distance between the side walls being defined as the width of the framing element, said tool comprising:

(a) a main body portion comprising:

(1) a bottom surface which is adapted to rest on the bottom wall of the framing element,

(2) a top surface which is opposite said bottom surface, and

(3) a pair of opposite end surfaces, the distance between

said end surfaces being equal to the width of the framing element, each of said end surfaces having a recess which extends from said bottom surface to said top surface, said recess being substantially at a right angle to said bottom surface, and

(b) a handle which is attached to the main body portion, said handle having an elongated shank portion having a longitudinal axis which is at an angle to said bottom surface and to each of said recesses.

4,599,780

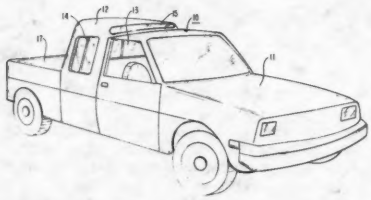
APPARATUS AND METHOD OF ADDING A PASSENGER COMPARTMENT TO A MINI-TRUCK OR A SIMILAR STRUCTURE

William H. Rohrbacher, 701 S. State St., Hemet, Calif. 92343

Filed Aug. 22, 1983, Ser. No. 524,939

Int. Cl.[4] B21K *21/16;* **B23P** *17/04;* **B62D** *21/00;* **B60J** *9/00*

U.S. Cl. 29—401.1 **19 Claims**



1. A method of adding a passenger section to a mini-truck vehicle, said vehicle of the type having a front section containing front wheels and a drivers compartment and contiguous with a rear cargo section having rear wheels and a cargo containing area, said front and rear sections coupled together via at least two longitudinally extending frame rails, comprising the steps of:

(a) removing the cargo containing area to expose said frame rails,

(b) forming two spaced apart reference points on each of said frame rails by placing a jig over each of said frame rails, said jig having at least two spaced apart apertures, drilling holes in said frame rails in accordance with the location of said apertures on said jig, and inserting dowel pins in said apertures as drilled in said frame rails and marking said frame rails between said drilled apertures to provide a guide line for cutting said respective rails,

(c) cutting said frame rails between said reference points and along said guide line to provide cut portions,

(d) extending said cut rails by mounting an extension member between comprising a U-shaped channel between and over each said cut portions and by aligning speed apart edges of said extension member abutting against said dowel pins,

(e) welding said extension member to said cut frame rails to form extended rails,

(f) securing a support member between said extending rails, and

(g) placing a passenger section upon said support member.

18. An extended frame assembly for a vehicle comprising at least two longitudinally extending frame rails, each frame rail consisting of two rail sections formed by cutting a single frame rail, a pair of spaced dowel pins respectively extending through the rail sections of each frame rail, said dowel pins being spaced apart an equal distance on their respective frame rails before cutting, and an extension member extending over a portion of each rail section with its respective ends in abutment with said dowel pins, the lengths of the extension members being equal so that the lengths of the extended frame rails thus formed are equal.

4,599,781

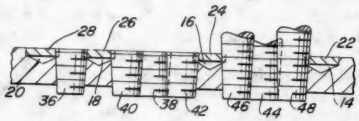
METHOD OF REPAIRING CRACKED THIN METAL PARTS

David Diperstein, 125 Bickley Rd., Glenside, Pa. 19038

Filed Dec. 17, 1984, Ser. No. 682,461

Int. Cl.[4] B23P *6/04*

U.S. Cl. 29—402.11 **12 Claims**



1. A method of repairing a cracked or fractured thin metal part comprising the steps of providing a hole of diameter no greater than 0.200" in a crack or fracture in the part, tapping the hole with a tap having more than 27 threads per inch, securing a plug having the same number of threads per inch as the tapped hole in the tapped hole thereby filling the gap of the crack or fracture, and torquing the plug until the torquing force exceeds the strength of the plug whereby a portion of the plug extending beyond the surface of the part snaps off.

4,599,782

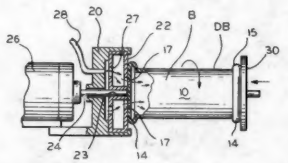
METHOD OF MAKING A COMPOSITE CONTAINER

Jerome S. Heisler, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.

Filed Dec. 13, 1984, Ser. No. 667,375

Int. Cl.[4] B31Q *3/00;* **B31C** *1/00*

U.S. Cl. 29—428 **1 Claim**



1. A method of forming a composite container, comprising the steps of:

(a) molding from thermoplastic material a hollow body having a generally cylindrical side wall and a pair of end walls on opposite ends of the side walls;

(b) mounting said body on a structure which can hold said body to accommodate the introduction of air into said body and to accommodate the rotation of said body about its longitudinal axis;

(c) exerting pressure against said end walls of said body to prevent its movement in an axial direction while said body is being filled with air and being rotated about its axis;

(d) while the ends of said body are being subjected to pressure introducing into the interior of said body through one of said body ends air under sufficient pressure to prevent the collapse of said body when said body side wall is subjected to external pressure, whereby said body can serve as a mandrel;

(e) rotating said body about its longitudinal axis;

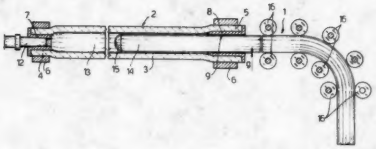
(f) while said body is being rotated, wrapping and securing around the outer surface of said body side wall at least one layer of flexible sheet material such as paperboard.

4,599,783

PROCESS FOR THE CONSTRUCTION OF A COMPOSITE TUBE COMPRISING A METAL TUBE, IN PARTICULAR A COPPER TUBE, AND A CLADDING OF DEFORMABLE FOAM MATERIAL

Pier B. Ceccacci, Florence, Italy, assignor to Tubi Italia S.p.A., Florence, Italy

Filed Jun. 28, 1984, Ser. No. 625,557
Claims priority, application Italy, Dec. 19, 1983, 68318 A/83
Int. Cl.⁴ B23P *11/02, 19/02, 17/00*
U.S. Cl. 29—450 **12 Claims**



1. The method of constructing a composite insulated tube, comprising the steps of:

(a) providing a length of apertured deformable tubular cladding having first and second ends;

(b) inserting fluid supply means into said first end;

(c) inserting an apertured bushing into said second end, said bushing having a diameter exceeding the internal diameter of said cladding and thereby enlarging the diameter of said cladding aperture at said second end;

(d) clamping said first end about said fluid supply means and said second end about said bushing so that the axis of said cladding is rectilinear;

(e) introducing a closed end of a tube into said bushing aperture and thereby substantially sealing said bushing aperture;

(f) introducting pressurized fluid through said fluid supply means to said cladding aperture and thereby radially expanding said cladding;

(g) advancing said closed end through said cladding; and,

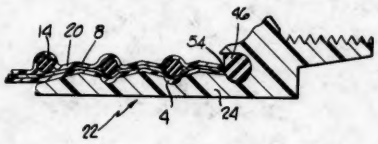
(h) evacuating the fluid from said cladding and thereby causing said cladding to radially contract about said tube.

4,599,784

METHOD OF ASSEMBLING FLEXIBLE CONDUIT AND FITTING

Anthony Canu, Jr., Waterbury; Allen G. Houbo; Kenneth F. Knight, both of Watertown; Albert L. Tufano, Stratford, and Anthony J. Porzio, Waterbury, all of Conn., assignors to Anamet, Inc., Waterbury, Conn.

Filed Feb. 27, 1984, Ser. No. 584,208
Int. Cl.⁴ B23P *11/02*
U.S. Cl. 29—450 **6 Claims**



1. A method for assembling a flexible conduit and a single piece fitting to provide an interlocked assembly of improved elongation resistance comprising:

providing an inner layer for the conduit having substantially smooth cylindrical inner and outer surfaces of predetermined diameters,

securing at least one reinforcement tape to the outer surface of said inner layer and positioning said reinforcement tape so that it extends in a longitudinal direction,

applying to said outer surface a spiral coil having an inner diameter less than the diameter of said outer surface to displace portions of said layer and said tape under said spiral coil and form a spiral protuberance extending inwardly of said predetermined inner surface diameter, said tape conforming to the displaced portions of said layer and having a resistance to elongation greater than the resistance to elongation of said inner layer,

applying a conforming cover over said spiral coil to encapsulate said coil between said inner layer and said cover;

providing a single piece fitting having a male element and an integral confining wall spaced therefrom, said male element being provided with an outer surface of varying diameters and a plurality of said varying diameters being greater than the predetermined inner surface diameter of said inner layer;

applying longitudinal and rotational forces to said flexible conduit and said fitting to cause relative movement to position said flexible conduit over said male element; and

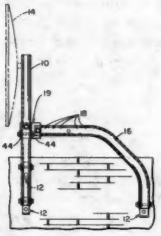
expandably displacing a portion of said inner layer and said cover located between adjacent coils of said spiral protuberance by said plurality of greater diameters on said male element so as to produce compressive forces exerted on said male element by said inner layer, said spiral coil and said cover so as to resist forces trying to separate said flexible conduit from said fitting while limiting the elongation of the conduit to less than 10 percent when subject to a tensile force of at least 75 pounds.

4,599,785

METHOD FOR INSTALLING A MOUNTING STRUCTURE ON THE EXTERIOR OF A BUILDING

Lyle W. Hovland, Murrysville, and James D. Klingensmith, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 473,018, Mar. 7, 1983, Pat. No. 4,510,502. This application Dec. 17, 1984, Ser. No. 682,425
Int. Cl.⁴ B23P *19/00*
U.S. Cl. 29—526 R **1 Claim**



1. A method for installing a mounting structure on the roof of a building having rafters and roofing materials located over the rafters, the method comprising the steps of:

finding the rafters;

fastening brackets to the rafters by directing fastening means through the brackets and roofing materials and into the rafters;

placing the ends of tubular members in or on the brackets, the bracket and the ends of the tubular members having apertures therein for receiving a bolt;

aligning the apertures of each bracket and an associated end of a tubular member;

inserting a bolt having a shank through the aligned apertures;

threading a nut on the exposed end of the bolt's shank; and

tightening the respective nuts and bolts to a predeterminted extent to prevent relative movement between the tubular

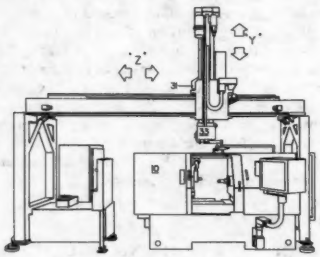
members and the brackets, said extent being indicated and characterized by a predetermined amount of deformation in the tubular member.

4,599,786

GRINDING MACHINE WITH APPARATUS FOR CHANGING GRINDING WHEEL TOOLS AND WORKPIECES

Herbert R. Uhtenwoldt, Worcester, Mass., assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 4, 1984, Ser. No. 647,314
Int. Cl.[4] B23Q *3/156*
U.S. Cl. 29—568 **1 Claim**



1. In a grinding machine having a workhead spindle means for rotatably supporting and driving a workpiece, and having a grinding wheel spindle means for rotatably supporting and driving a grinding wheel tool, an improved device for changing workpieces, wherein the improvement comprises:

(a) a base frame;

(b) grinding wheel tool storage means remotely located with respect to said grinding wheel spindle means;

(c) workpiece staging means remotely located with respect to said workhead spindle means;

(d) a carriage movable on said frames between a first position proximal said workpiece staging area and a second position proximal said workhead spindle means, and further movable between a third position proximal said grinding wheel tool storage means and a fourth position proximal said grinding wheel tool storage means;

(e) workpiece gripper means located on said carriage, said workpiece gripper means including means for gripping a rough workpiece and means for gripping a finished workpiece;

(f) grinding wheel tool gripper means located on said carriage, said tool gripper means including means for gripping first and second grinding wheel tools;

(g) automatic means for releasably retaining said grinding wheel tool with said grinding wheel spindle means;

(h) automatic means for releasably retaining said workpiece with said workhead spindle means;

(i) means for effecting relative movement between said workpiece gripper means and said workhead spindle means for alternately applying said rough and finished workpiece gripping means with respect to said workhead spindle means; and

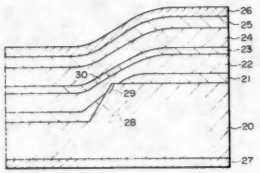
(j) means for effecting relative movement between said grinding wheel tool gripper means and said grinding wheel spindle means for alternately applying said first and second grinding wheel tools with respect to said grinding wheel spindle means.

4,599,787

METHOD OF MANUFACTURING A LIGHT EMITTING SEMICONDUCTOR DEVICE

Yukihiro Sasatani, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 151,851, May 21, 1980, Pat. No. 4,333,061. This application Nov. 25, 1981, Ser. No. 324,893
Claims priority, application Japan, May 30, 1979, 54-67307
Int. Cl.[4] H01L *33/00*; H01S *3/19*
U.S. Cl. 29—569 L **1 Claim**



1. A method of manufacturing a stripe type double hetero structure light emitting semiconductor device consisting of the steps of:

forming a stair-shaped step part on a semiconductor substrate of a first conductivity type extending in the form of a stripe;

forming a current blocking layer of a second conductivity type by depositing said current blocking layer by liquid-phase epitaxial growth whereby the thickness of said current blocking layer at a position more than 20 μm away from the base of said stair-shaped step part is less than one-fourth of the height of said step part and whereby a part of said current blocking layer is interrupted by an edge portion of said stair-shaped step part to form a break area in the form of a strip, said break area forming a current concentration region;

forming a lower clad layer of said first conductivity type over said current blocking layer and break area to a thickness whereby said break area is completely covered with said lower clad layer;

forming an active layer of one of said first and second conductivity types over said lower clad area; and

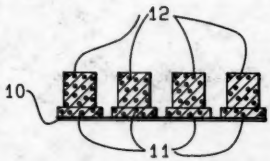
forming an upper clad layer of said second conductivity type over said active layer.

4,599,788

SOLID ELECTROLYTIC CAPACITOR MANUFACTURE

Gordon R. Love, and Richard J. Millard, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Jul. 13, 1984, Ser. No. 630,916
Int. Cl.[4] H01G *9/24, 5/00*
U.S. Cl. 29—570 **10 Claims**



1. A solid electrolytic capacitor manufacture comprising the steps of depositing an array of pads of a tantalum ink composition onto a tantalum substrate, placing a tantalum pellet on end on selected of said pads, sintering together the assembly of said substrate and said pads and said pellets, whereby said assembly contains a joint with a density intermediate the densities of said substrate and said pellets, providing said assembly with an

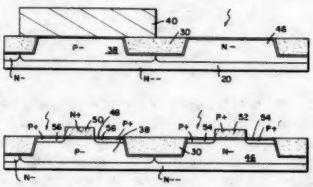
oxide dielectric layer and a solid electrolyte layer and a counterelectrode layer, and separating said assembly along the lines of said array.

4,599,789

PROCESS OF MAKING TWIN WELL VLSI CMOS

John T. Gasner, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 15, 1984, Ser. No. 620,835
Int. Cl.[4] H01L *21/265*; B01J *17/00*
U.S. Cl. 29—571 **14 Claims**



1. A method for forming complementary insulated gate field effect transistors comprising:

forming at least one insulative insert in a substrate of a first conductivity type to form at least a first and second mesas in said surface separated laterally by said insert;

forming a first mask layer having a first opening on said substrate;

introducing second conductivity type impurities opposite said first conductivity type into said substrate through said first opening to form simultaneously a second conductivity type well in said second mesa having a higher impurity concentration at the bottom of said well and guard ring under a portion of said insert;

forming a second mask on said surface, the reverse image of said first mask using said first mask as a template;

introducing first conductivity type impurities into said substrate through an opening in said second mask to form simultaneously a first conductivity type well in said first mesa having a high impurity concentration at the bottom of said well and a guard ring under a portion of said insert;

forming a gate insulative layer on said substrate;

forming first and second gates on said gate insulative layer over said first and second wells, respectively;

introducing second conductivity type impurities into said first well using said first gate as a mask to form shallow source and drain regions;

introducing first conductivity type impurities into said second well using said second gate on a mask to form shallow source and drain regions;

forming insulative spacers extending lateral from said first and second gates over said source and drain regions;

introducing sell using said second gate and spacers as a mask to form deep source and drain regions having a greater depth than said shallow source and drain regions.

4,599,790

PROCESS FOR FORMING A T-SHAPED GATE STRUCTURE

Bumman Kim, Richardson, and Paul Saunier, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 30, 1985, Ser. No. 696,299
Int. Cl.[4] H01L *21/285*
U.S. Cl. 29—571 **21 Claims**

1. A process for forming a T-shaped gate structure, comprising the steps of:

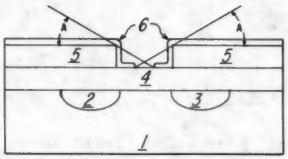
providing a substrate;

forming a first masking layer on the surface of said substrate;

forming a second masking layer on the surface of said first masking layer;

patterning said second masking layer;

depositing a masking material on the surface of said first and second masking layers from a deposition source at an acute angle relative to the surface of said first and second masking layers thereby depositing a third masking layer on the surface of said first and second masking layers



having an opening much smaller than and within the opening provided by said patterned second masking layer;

etching the portion of said first masking layer exposed by said smaller opening in said third masking layer to said substrate;

depositing gate material on the surfaces of said substrate and said first, second and third masking layers;

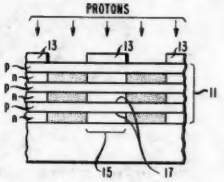
removing said first, second and third masking layers thereby lifting off a portion of said deposited gate material.

4,599,791

METHOD OF MAKING INTEGRATED CIRCUITS EMPLOYING PROTON-BOMBARDED AlGaAs LAYERS

Marlin W. Focht, Stewartsville; Louis A. Koszi, Scotch Plains, and Bertram Schwartz, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 28, 1983, Ser. No. 555,670
Int. Cl.[4] H01L *21/76, 21/263*
U.S. Cl. 29—576 B **6 Claims**



1. A method of manufacturing a device comprising the steps of

(a) providing a multi-layered structure containing n-type and p-type layers of AlGaAs, and

(b) proton bombarding at least one of said n-type layers and one of said p-type layers at a dose and energy so that only said at least one n-type layer becomes highly resistive.

4,599,792

BURIED FIELD SHIELD FOR AN INTEGRATED CIRCUIT

Paul E. Cadé, Colchester; Badih El-Kareh, Milton, and Ick W. Kim, St. Albans, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

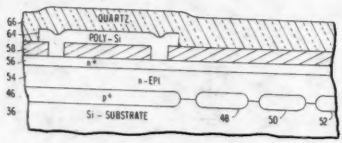
Filed Jun. 15, 1984, Ser. No. 620,982
Int. Cl.[4] H01L *21/20, 21/31*
U.S. Cl. 29—576 W **10 Claims**

1. A method of fabricating a semiconductor structure, comprising the steps of:

depositing an epitaxial semiconductor layer on a first semiconductor substrate;

forming and patterning a first dielectric layer overlying said epitaxial layer;

forming a field shield layer of a conductive material on predetermined portions of said first dielectric layer and on predetermined portions of said epitaxial layer;



covering said field shield layer and all exposed portions of said first dielectric layer and said epitaxial layer with a bonding material;

bonding a second substrate to the side of said first substrate covered with said bonding material, thereby forming a bonded structure; and

removing said first substrate from said bonded structure.

4,599,793

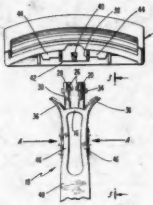
RAZOR CONNECTOR

Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.

Filed May 23, 1984, Ser. No. 614,237

Int. Cl.[4] B26B *21/00*

U.S. Cl. 30—47 **8 Claims**



1. A razor connector for connecting a razor head to a razor handle, comprising:

a base;

a first pair of upstanding members attached to said base and having opposed vertical interior faces defining a centrally-disposed vertical gap therebetween;

a pair of flanges, one attached to each of said opposed vertical interior faces adjacent a top of each face to project toward each other into said gap;

a cavity in an outer surface of said razor head, for receiving at least a top portion of said first pair of upstanding members;

a bar attached to said razor head across said cavity for protruding into said gap and being secured by said pair of flanges when said first pair of upstanding members is at least partially inserted into said cavity; and

a second pair of upstanding members, connecting said base to said handle, for selectably applying a bending force to said base, and so for selectably increasing a distance between said flanges to cause said flanges to release said bar when said first pair of upstanding members is in said cavity.

4,599,794

APPARATUS FOR BARING ELECTRIC CABLES

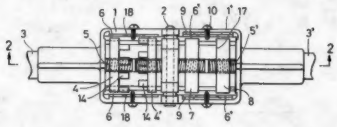
Takashi Moriyama, 2-3-3, Uozaki-nishimachi, Higasbinada-ku, Kobe 658, Japan

Filed Oct. 25, 1984, Ser. No. 664,498

Claims priority, application Japan, Apr. 7, 1984, 59-069808

Int. Cl.[4] B21F *13/00*

U.S. Cl. 30—90.6 **2 Claims**



1. Apparatus for baring a portion of an electric cable having a conductive core and a sheath surrounding the core, said apparatus comprising first and second casing means, each of said casing means having an open side and said casing means being hinged together on an axis whereby said casings are pivotable to close said open sides, a pair of blades fixed to each of said casing means and mounted substantially symmetrically about said axis, each of said blades having a semicircularly concave cutting edge extending perpendicularly to said axis and having substantially the same radius as the cable core, holders supported by said first casing means and extending between said blades of said first casing means, and a cutter which is supported by said second casing means and extending between said blades, said cutter having a straight cutting edge extending substantially parallel to said axis, whereby when said casings are pivoted to close said open sides said holders compress the cable against said straight cutting edge and said concave cutting edges form an arcuate cut in the sheath, said holders of said first casing means comprising a pair of holders located on opposite sides of the midpoints of said concave cutting edges of said first casing means, a support on said second casing means, said support having a side extending parallel to said axis, said side of said support and straight cutting edge being located on the opposite side of the midpoints of said concave cutting edges of said second casing means, a screw supported rotatably by each of said casing means and extending perpendicularly to said axis, each of said screws having two oppositely directed threads thereon, said holders of said first casing means being supported slidably in said first casing means and having a threaded hole formed therethrough which engages with one of said threads of said screw of said first casing means, so as to move said holders toward and away from each other, said support and cutter each having a threaded hole formed therethrough and engaging with one of said threads of said screw of said second casing means, so as to moves said support and cutter toward and away from each other.

4,599,795

CUTTING TOOL

Takashi Yokoyama, Mie, Japan, assignor to MCC Corporation, Mie, Japan

Filed Jun. 8, 1984, Ser. No. 618,825

Claims priority, application Japan, Jun. 11, 1983, 58-89194[U]; Jun. 11, 1983, 58-89195[U]; Jun. 11, 1983, 58-89196[U]

Int. Cl.[4] B26B *17/00*

U.S. Cl. 30—188 **7 Claims**

1. A cutting tool comprising:

a stationary blade and a movable blade positioned facing each other and both having teeth portions in mesh with each other, each of said blades having a cutting edge portion at the leading end thereof so that said cutting edge portions face each other, said movable blade having a plurality of notches along the rear end thereof, and said

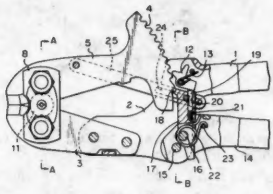
blades being pivoted to a common plate at points outward of said cutting edge portions;

a pair of handles pivoted toward each other so as to be opened or closed relative to each other for pivoting said movable blade relative to said stationary blade so that said cutting edge portions may be opened or closed relative to each other, one handle of said pair of handles being fixed to the rear of said stationary blade;

a pawl pivoted to said one handle of said pair of handles and engageable with one of said notches so as to prevent the return of said movable blade;

a push bar pivoted to the other handle of said pair of handles;

projection means, provided on said push bar, for pushing up



one of said notches when said pair of handles are moved toward each other;

means, arranged adjacent to said pawl, for elastically biasing said pawl around a pivot axis thereof so as to keep the pawl in a position disengaged from all of said notches under normal conditions; and

means, provided on said push bar, for elastically urging said pawl to engage with one of said notches by forcing said pawl to rotate against an elastically biased force producted by said elastically biasing means when said pair of handles are fully closed relative to each other;

wherein said elastically urging means, having said pawl engage with one of said notches, is an elastic pin supported by a spring in a hole provided in said push bar.

4,599,796

CUTTER BLADE DEVICE OF MOWING MACHINE

Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,689

Claims priority, application Japan, Apr. 20, 1984, 59-58320[U]

Int. Cl.⁴ A01D *50/00*

U.S. Cl. 30—276 **1 Claim**

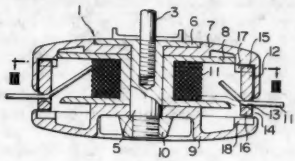
1. A cutter blade device of a mowing machine comprising:

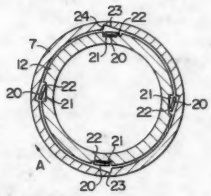
a rotary casing;

at least one flexible cord held in the rotary casing in coiled form; and

an inertia shifter formed with an aperature for drawing a free end portion of the cords therethrough from the rotary casing to outside, said inertia shifter being arranged in the rotary casing for sliding movement both axially and peripherally of the rotary casing and capable of being brought into and out of locking engagement with the rotary casing in a position anterior to the shifter with respect to the direction of rotation of the rotary casing; wherein the improvement comprises:

at least one pawl member provided to one of the inertia shifter and rotary casing and operable in a direction opposite the direction of rotation of the rotary casing; and





at least one receiving portion provided to the other of the inertia shifter and rotary casing and operative to come into engagement with the pawl member.

4,599,797

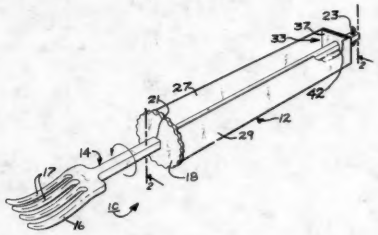
REVOLVABLE EATING UTENSIL AND METHOD OF CLEANING SAME

William P. Bax, 3044 Polly La., Flossmoor, Ill. 60422

Filed Oct. 12, 1984, Ser. No. 660,408

Int. Cl.⁴ A47J *43/28*

U.S. Cl. 30—323 **15 Claims**



1. An eating utensil for use with comestibles comprising:

an elongated rigid member having an enlarged comestible engageable portion at the front end thereof and having a rear shank portion;

a handle portion for rotatably supporting said rear shank portion, the handle portion being an open frame, said frame being generally rectangular in shape and having four walls, said walls including a pair of oppositely-disposed parallel spaced-apart front and rear short end walls at respective ones of a front end and a rear end of the handle, and a pair of oppositely-disposed parallel spaced-apart long side walls;

a pair of oppositely-disposed front and rear bearing means disposed in the respective front and rear walls for axially rotatably supporting said shank portion for enabling said rigid member to revolve about its axis relative to said handle portion, each one of said front and rear bearing means including means defining a bearing opening extending through the respective end walls, the rear shank por-

tion extending through said bearing openings and rearwardly beyond the rear end of the handle portion;

a thumb wheel attached to the rear shank portion to enable a user to rotate the elongated rigid member relative to the handle portion, including means for attaching the thumb wheel to the rear shank portion forwardly of the handle portion, said thumb wheel being substantially larger transverse dimension than the distance between the side walls of the handle portion to facilitate manipulation by the hand of the user while grasping the handle portion; and

means for limiting axial movement of said shank portion relative to said handle portion, said means including a member removably attached to a rear distal end portion of the rear shank portion extending rearwardly beyond the rear end of the handle portion so that said member can be removed from said rear shank portion to permit the rear shank portion to be slipped out of the handle portion for cleaning purposes;

wherein the rear shank portion of the elongated rigid member has a length sufficient to extend through both bearing openings, and a distal end portion extending rearwardly beyond the rear bearing opening; and

wherein said rear shank portion has a cross-section with a first shape and each of the bearing openings has a second shape, one of said first and second shapes being generally circular and the other one of said first and second shapes being generally polygonal.

4,599,798

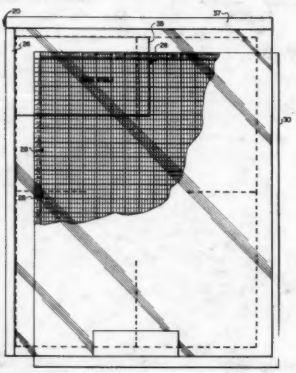
LAYOUT DEVICE FOR WORD PROCESSORS

James Steele, 923 Sundown La., DeSoto, Tex. 75115

Filed Jul. 5, 1985, Ser. No. 752,029

Int. Cl.[4] G01B *5/00*

U.S. Cl. 33—1 B **10 Claims**



1. Apparatus for facilitating lay-out work with a word processor comprising:

a rectangular base sheet;

a rectangular transparent cover substantially equal to the base sheet in length and width;

said cover sheet overlying said base sheet in substantial registry therewith and being attached thereto along one mutual edge thereof;

magnetically actuated clamp means on said base sheet and said cover sheet adjacent edges thereof opposite said edge of attachment;

linear alignment means positioned between said base sheet and said cover sheet along said edge of attachment and along an edge adjacent thereto;

and a transparent grid sheet having rectilinear grid indicia thereon, said grid sheet being positionable between said base sheet and said cover sheet.

4,599,799

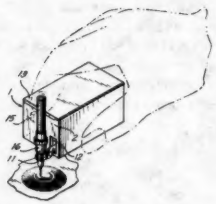
ELECTRIC STIPPLER WITH LOBED CAM-DISK DRIVE

Ruben M. Lopez, 235 Quentin Rd. -3C, Brooklyn, N.Y. 11223

Filed Aug. 9, 1984, Ser. No. 639,234

Int. Cl.[4] B43L *13/00, 13/24*

U.S. Cl. 33—18.2 **5 Claims**



1. An electric stippler for use by draftsmen, the stippler comprising: a housing, the housing being of small size adapted to be held in the hand of the draftsman during use of the stippler, a cantelever bar disposed within the housing in a horizontal position between a top wall and a bottom wall of the housing, the bar having a rear end fixed to a support within the housing and having a forward free end projecting freely through a vertical slot in a front wall of the housing, a stippling pen fixed to the free end and having a tip extending downward, the bar and pen as a unit being vibratable relative to the fixed end of the bar, a battery energizable mini-motor within the housing, and means operatively associated with the mini-motor for imparting vibration to the bar and pen as a unit.

4,599,800

CALIPER FOR MEASURING DEFORMABLE OBJECTS

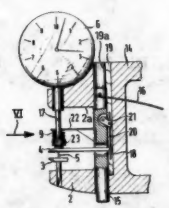
Helmut Wyrwich, Jülich, Fed. Rep. of Germany; Georgi Graschew, Sofia, Bulgaria; Johann Chatzipetros, Frechen, and Ludwig E. Feinendegen, Jülich, both of Fed. Rep. of Germany, assignors to KFA—Kernforschungsanlage Julich GmbH, Jülich, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,568

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318823; Mar. 22, 1984, 3410509

Int. Cl.[4] G01B *3/24, 5/06*

U.S. Cl. 33—143 C **11 Claims**



1. An instrument for measuring the size of an easily deformable object such as a body of tumor tissue, comprising:

a pair of relatively movable members defining a measuring caliper and formed at respective ends with contact plates adapted to receive said object between them;

an indicator operatively connected to at least a movable one of said plates and displaying a measurement of the size of said object as a function of the separation between said plates;

means for effecting relative displacement of said members to relatively displace said plates to embrace said object between them; and

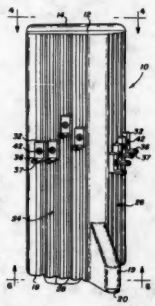
means interposed between one of said plates and the respective member for controlling the contact pressure of said one of said plates against said object, said means interposed between said one of said plates and said one of said members including a slider movable in a direction of measurement, and coupling means between said slider and said one of said plates for mechanically effecting a force-lock blocking further movement of said slider when a determined contact pressure is achieved.

4,599,801

PORTABLE GAGE INSTRUMENT FOR USE IN PERFORMING PRECISION MULTIPLE DIMENSION MEASUREMENTS

Phillip J. Kronzer, Los Gatos; Nick Caputo, San Jose; Bernard M. Combs, Los Altos; Andrew Conrad, Campbell; James Kalani, and Timothy L. Kronzer, both of Los Gatos, all of Calif., assignors to K & K Manufacturing, Inc., Campbell, Calif.

Filed Oct. 22, 1984, Ser. No. 663,379
Int. Cl.[4] G01B *3/20, 5/02*
U.S. Cl. 33—169 R **4 Claims**



1. A portable precision gage apparatus comprising:
means forming a base to be placed upon a flat work surface, said base including means forming a plurality of vertically extending guide ways, said base being generally triangular in horizontal cross-section and including at least two groups of said guide ways, each group of which lies in a plane angularly intersecting another plane in which another group of said guide ways lies;
a plurality of slide means adapted to mate with and be selectively positionable along respective ones of said guide ways, each of said slide means including means forming a precision measurement pad; and
means for locking each of said slide means in a selected position along a corresponding guide way, whereby said gage apparatus may be subsequently moved to a different location at which the distances between a supporting surface and each of said pads may be used to provide precision reference dimensions.

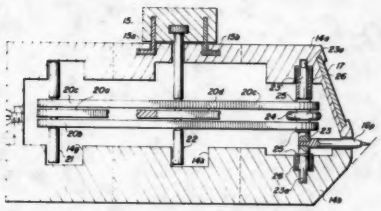
4,599,802

DRAFTSMAN'S DIMENSIONAL DIVIDER

Walter L. Keller, 3901 Gordon Dr. S., Naples, Fla. 33940

Filed Jul. 8, 1985, Ser. No. 752,811
Int. Cl.[4] B43L *9/08*
U.S. Cl. 33—192 **9 Claims**

1. A dimensional divider for use in dividing a line of given length into a predetermined number of equal parts comprising:
a plurality of identical elongated flat links whose ends and centers are hingedly connected together by a plurality of cylindrical shafts to form a set of lazy tongs,
a plurality of pointed rods, the upper end of each pointed rod being fixedly connected to one of said cylindrical shafts on one side only of the set of lazy tongs,
a case enclosing said set of lazy tongs with the pointed ends of said rods projecting out of a first elongated slot along the bottom of said case,
one end of said lazy tongs being fixedly attached to one end of said case,
one of said shafts being attached to the opposite end of said set of lazy tongs, said shaft extending out through a second elongated slot in the front of said case which is inclined relative to the case bottom,



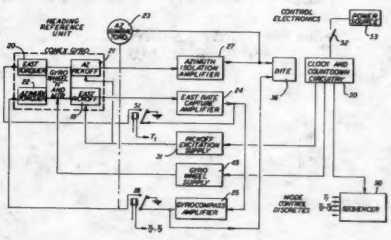
a finger-operable tab attached to said shaft slidable along the second elongated slot through which the shaft extends for moving the lazy tongs and the pointed rods so that the pointed ends of two predetermined rods lie at the extremities of a line to be divided into equal parts, and
means for maintaining said pointed rods in parallel position to each other and perpendicular to the bottom of the case.

4,599,803

HEADING INDICATOR AND METHOD OF USING

George Galuschak, Hasbrouck Heights, and Richard J. Stomber, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Aug. 15, 1979, Ser. No. 66,702
Int. Cl.[4] G01C *19/38*
U.S. Cl. 33—301 **1 Claim**



1. A method of indicating heading comprising the steps of:
disposing a single degree of freedom platform on a base so as to be rotatable about a vertical axis;
suspending a two degree of freedom gyro, having a first and second sensitive axes, on said platform such that said second sensitive axis is aligned with said vertical axis;
sensing rotation about said first sensitive axis;
developing a first output proportional to the rotation about said first sensitive axis;
sensing rotation about said second sensitive axis;
developing a second output proportional to the rotation about said second sensitive axis;
torquing said gyro about said first sensitive axis an amount proportional to said first output;
torquing said gyro about said second sensitive axis an

amount proportional to said first output for a predetermined amount of time; and

rotating said platform an amount proportional to the second output.

4,599,804

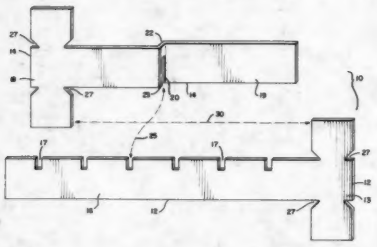
LINE GUIDE

Matthew P. Amos, 3602 Bonny Brook Rd., Harrisburg, Pa. 17109

Filed Apr. 24, 1984, Ser. No. 603,422

Int. Cl.[4] G01C *15/10*

U.S. Cl. 33—408 **7 Claims**



1. An improved line guide comprising a base member consisting of a main body and a "T" post, the main body of said base member containing a series of notches, an adjustable member consisting of a main body and a "T" post, the main body of said adjustable member containing at least one offset notch that is disposed so as to permit the cooperative mating of said offset notch with any one of the series of notches on the main body of the base member, thus providing a means of adjustably and cooperatively combining said members and further providing a means of adjustably and removably securing said members to a construction surface, and a means of removably securing a guide line to said guide.

4,599,805

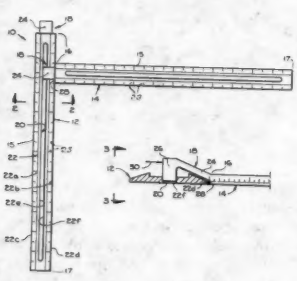
TRANSMUTABLE RULE

Amando C. Padilla, 187 Apartado Postal, Hermosillo, Sonora, Mexico

Filed Nov. 21, 1984, Ser. No. 673,717

Int. Cl.[4] B43C *7/06*

U.S. Cl. 33—464 **4 Claims**



1. A transmutable rule comprising,

a pair of individual rules,

each individual rule having scales along its side edges and each having a longitudinal slot therein extending nearly, but not entirely, its full length, and

each individual rule including guide means at one end engageable in the slot of the other individual rule in interfitting relation in which the individual rules are mutually perpendicular, and relatively slideable, and remain in said perpendicular relation throughout their sliding movement, each guide means being resiliently attached to a respective one of said rules,

each rule having mutually opposed gripping elements, one of which is on the guide means thereof, so positioned that when the guide means of one rule is in the slot of the other, said opposed gripping elements frictionally engage a structural element of the other rule; and the guide means, through the resiliency thereof, effects yieldable frictional gripping by said opposed gripping elements on the other rule, in the absence of positive locking.

4,599,806

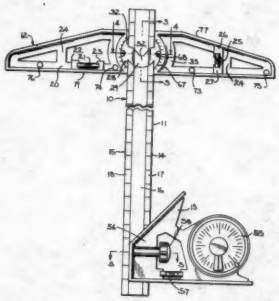
CARPENTER'S SQUARE AND PROTRACTOR

Randall J. Wright, 2000 Moraine End, Delafield, Wis. 53018

Filed Feb. 1, 1985, Ser. No. 697,139

Int. Cl.[4] B43L *7/06*

U.S. Cl. 33—469 **16 Claims**



1. An improved layout square device for accurately duplicating the marking of an angle onto a surface comprising:

a first elongated member having a flat surface along a longitudinal axis, with a straight edge adjacent thereto;

a second member also having a longitudinal axis and defining at least one straight edge;

rotatable protractor means operatively associated with said first and second members and providing rotation in a given plane; and

draw bolt adjustment means defined by guide slot means having a T-shaped configuration operatively positioned in one of said first or second members, a bolt having a head and neck portion of a similar configuration for slidable engagement therein and a nut for engagement with said bolt, said bolt and nut arranged to threadably secure said first and second members together in a substantially transverse manner with respect to said plane of rotation.

10. A multifunctional square and protractor device for accurately duplicating the marking of an angle onto a surface comprising:

a blade member having a flat surface along a longitudinal axis and at least one straight edge;

a head member also having a longitudinal axis and at least one straight edge;

rotatable protractor means including a compartment in said head member with a rotatable member operatively positioned therein and providing rotation in a given plane;

slide member means extending from said rotatable member and positioned to hold said blade member thereover in a substantially centered manner; and

draw bolt adjustment means operatively positioned in a substantially transverse manner with respect to the plane of rotation of said blade member and said head member defined by guide slot means operatively positioned in one of said blade or head members, a bolt slidably mounted in

said slot means and a nut for engagement with said bolt, said bolt and nut arranged to threadably secure said blade and head members together.

4,599,807

PROCESS FOR DRYING POLYMERIC BEADS AND ASSOCIATING SHADING PIGMENTS THEREWITH

Laura M. Wells, Mt. Prospect; Fred D. Hawker, Villa Park; Maryam L. Dachniwskyj, and Charles W. Strobel, both of Schaumburg, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 9, 1984, Ser. No. 658,625
Int. Cl.[4] F26B *3/00*
U.S. Cl. 34—9 **9 Claims**

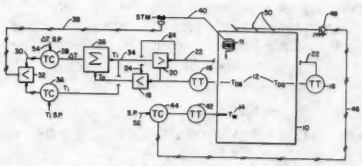
1. A process for drying a water-wet paste containing polymeric beads without agglomeration comprising, adding to said wet paste a proportion of an organic solvent which forms an azeotrope with water in an amount providing a stirrable mixture, and heating the solvent-containing aqueous paste to remove the water as an azeotrope with said solvent and to produce a water free suspension of said beads in organic solvent, the proportion of said organic solvent in the suspension which is formed being minimized by adding a resinous vehicle in organic solvent solution to the solvent-containing aqueous paste after substantially all the water has been removed, and continuing the application of heat to remove undesired organic solvent and thereby increase the solids content.

4,599,808

DRYING METHOD AND APPARATUS FOR FIBROUS MATERIAL

Frederick D. Gelineau, San Jose, Calif., and Thomas B. Kinney, Foxboro, Mass., assignors to The Foxboro Company, Foxboro, Mass.

Filed Mar. 20, 1984, Ser. No. 714,005
Int. Cl.[4] F26B *21/10*
U.S. Cl. 34—27 **9 Claims**



1. The method of drying a fibrous material which comprises the steps of

circulating air past said material,

sensing the wet bulb temperature of air circulating past said material,

maintaining the wet bulb temperature of said air constant,

sensing the dry bulb temperature of said air before and after circulating past said material,

maintaining the dry bulb temperature drop in said air constant, thereby maintaining the evaporation from said material at a constant rate.

4,599,809

GRAIN DRYER SYSTEM

Donald H. Parkes, Lamoni, Iowa, assignor to Shivvers, Incorporated, Corydon, Iowa

Filed Sep. 13, 1984, Ser. No. 650,677
Int. Cl.[4] F26B *21/10*
U.S. Cl. 34—31 **30 Claims**

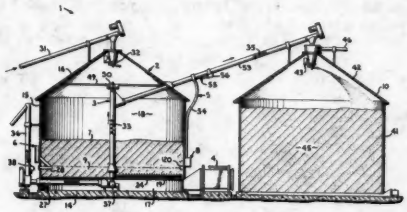
1. A method of drying grain comprising the steps of:

(a) providing a grain drying apparatus including grain dryer chamber means for holding grain, grain conveyor means to urge grain into and out of said chamber means, a heater unit to communicate heated air to said chamber means to dry said grain, grain moisture meter means for measuring the moisture content of said grain, and dryer control means having said grain conveyor means, said heater unit, and said moisture meter means interconnected thereto;

(b) conveying grain into said chamber means;

(c) communicating heated air to said chamber means to dry said grain;

(d) periodically directly measuring the moisture content of said grain from a drying zone near whereat said heated air first communicate with said grain such that the mositure content of the grain from near the inlet of the heated air is



measured and generating a grain moisture signal representative of the moisture content of said grain by said moisture meter means;

(e) communicating said grain moisture signal to said control means; and

(f) controlling the operation of said heater unit by said dryer control means in response to the moisture content represented by said grain moisutre signal and controlling the operation of said conveyor means to withdraw grain from said drying zone in response to said grain moisture content being near a preselected level.

4,599,810

WATERPROOF SHOE CONSTRUCTION

Guillaume Sacre, West Linn, Oreg., assignor to W. L. Gore & Associates, Newark, Del.

Continuation of Ser. No. 290,485, Aug. 6, 1981, abandoned. This application Nov. 18, 1983, Ser. No. 553,097
Int. Cl.[4] A43B *23/07*
U.S. Cl. 36—55 **9 Claims**

1. A shoe construction comprising:

(a) a sole;

(b) an integral upper having a bottom portion secured to said sole, panel portions extending upwardly from said bottom portion, a tongue and gussets connecting said tongue to said panel portions, said upper including a top opening

arranged to receive a foot and defined by the edges remote from said sole of said panel portions, tongue and gussets; and

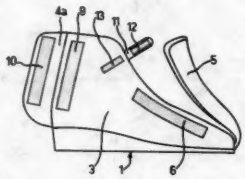
(c) a sock-like liner disposed in said upper, said liner being formed of material which is impervious of water, but pervious to perspiration vapor and being secured to said upper only proximate the top opening thereof.

4,599,811

EASY TO PUT ON WRAP-AROUND SHOE WHICH IS ADAPTABLE TO THE SHAPE OF THE FOOT

Jean L. Rousseau, Croix, France, assignor to Boussac Saint-Freres B.S.F., Lille, France

Filed Apr. 12, 1984, Ser. No. 599,709
Int. Cl.[4] A43B *21/00*
U.S. Cl. 36—105 **8 Claims**



1. A shoe comprising:

a foot supporting, stiff sole having two opposite side edges, a front edge, a rear edge, a bottom face, and a top face,

an upper comprising two separate side parts, each made of a continuous sheet of freely flexible supple material, each side part being continuously secured to one of said side edges only and free from the front and rear edges of the sole, and thereby spaced apart at front and rear so that the two upper side parts can be completely folded downwardly and outwardly about the opposite side edges of the sole in order to uncover completely the top face of the sole, so that a foot can be put onto the sole of the shoe while the shoe is completely open, the rear portion of least one said side part being long enough to overlap the other said side part when they are folded up about the foot,

a pair of adjustable instant hook-and-loop type fastening means, one located at the rear of each said upper side part and positioned so that the pair can mate, so that when the side parts are folded upwardly against a foot that has been put on the sole and adjusted according to the shape of the foot, the two upper side parts can then be overlapped at the rear and joined together by said fastening means at the rear of the foot, encasing the foot and fitting the foot, thereby supporting any specific foot shape, and

further comprising a third upper part forming a front tongue secured to the front edge of the sole only, so that it can be completely folded downwardly about the front edge of the sole,

said front tongue having side edges that, when folded upwardly, cover the front edges of the said two upper side parts and said additional fastening means being located on the bottom surface of said front tongue near its side edges and near front of the outer surface of said two upper side parts.

4,599,812

LEGGINGS

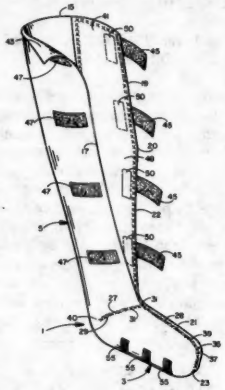
Wayne A. Harmsen, 607 Morris St., Fond du Lac, Wis. 54935

Filed Oct. 15, 1985, Ser. No. 787,057
Int. Cl.[4] A43B *3/00*
U.S. Cl. 36—1.5 **18 Claims**

1. A legging for wearing on a human leg and foot and made from a single piece of material comprising:

a. a leg wraparound adapted to cover at least a portion of a leg and defined by a top edge, a lower end having a region of material interposed between first and seccond laterally spaced lower margins, and first and second longitudinal edges extending between the top edge and the respective lower margins;

b. a foot enclosure adapted to cover a foot and defined by a pair of converging side edges and a bottom edge and an upper end having a region of material interposed between first and second upper margins that correspond with the



respective lower margins of the leg wraparound, the region of material of the foot enclosure being continuous with the region of material of the leg wraparound, the converging side dges and bottom edge being fastened to enclose the foot, the upper margins being joined to the respective lower margins of the leg wraparound to join the foot enclosure to the leg wraparound; and

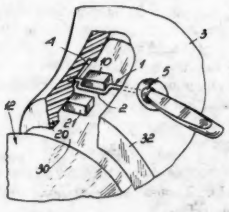
c. fastening means for releasably fastening the leg wraparound longitudinal edges to each other when the legging is in place on a wearer's foot and leg.

4,599,813

RAKE ADJUSTING DEVICE FOR THE LEG PORTION OF A SKI BOOT

Mariano Sartor, Via Barile 10, Montebelluna, Italy

Filed Feb. 15, 1984, Ser. No. 580,486
Claims priority, application Italy, Feb. 22, 1983, 20891/83[U]
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **6 Claims**



1. A rake adjusting device for the leg portion of a ski boot, comprising a detent element carried on a leg portion hingedly connected to a ski boot shell, said detent element being movable into a first position, whereat it engages by contact with a first projecting element attached to said shell, and a second position, whereat it disengages from said first projecting element and the travel limit contact between said leg portion and

said shell is established via a stop element, attached to said leg portion, and a second projecting element, attached to said shell, wherein said detent element, engaging the first projecting element, comprises a shaft carried rotatably on said leg portion and extending across said leg portion.

4,599,814

METHOD AND EQUIPMENT FOR MANGLING WET LAUNDRY

Friedrich Geiger, Todtenweis, Fed. Rep. of Germany, assignor to Kleindienst GmbH, Augsburg, Fed. Rep. of Germany

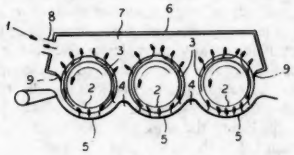
PCT No. PCT/EP83/00257, § 371 Date Jun. 4, 1984, § 102(e) Date Jun. 4, 1984, PCT Pub. No. WO84/01395, PCT Pub. Date Apr. 12, 1984

PCT Filed Oct. 3, 1983, Ser. No. 619,152

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236870

Int. Cl.⁴ D06F *65/10, 71/34*

U.S. Cl. 38—51 **17 Claims**



1. A method of mangling wet laundry which comprises the steps of:

closely juxtaposing a heated trough-shaped surface with a portion of the periphery of a roller covered with a steam-permeable wrapping;

rotating said roller to draw said wet laundry along said surface while pressing said wet laundry with said wrapping against said surface whereby steam is genrated by the contact of said surface with said wet laundry, said steam penetrating into the wrapping of said roller;

sealingly enclosing at least most of the balance of the periphery of said roller in a hood and evacuating said hood to withdraw steam penetrating into said hood through said wrapping upon generation by contact of said wet laundry with said surface; and

substantially completely excluding ambient air from penetrating into said hood while evacuating steam therefrom by maintaining the pressure in the hood at a pressure equal to or only slightly above ambient pressure whereby the steam evacuated from said hood is substantially free from air.

4,599,815

PHOTOGRAPH DISPLAY WHEEL

Tim R. Waldo, 6542 Blain, Fremont, Mich. 49412

Filed Aug. 31, 1984, Ser. No. 646,691

Int. Cl.⁴ A47B *49/00*

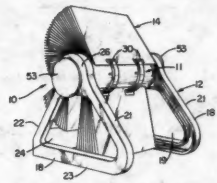
U.S. Cl. 40—377 **12 Claims**

1. A rotary display device for photographs and the like, comprising:

a rotatable spindle having annular tracks mounted in outer concentric relation to said spindle and a plurality of spindle-supporting spoke members projecting radially away from said spindle;

a stand supporting opposite ends of said spindle for axial rotation of said spindle relative to said stand, including a shaft member supporting said spindle on said stand and a control knob at one end of said shaft for manual rotation of said spindle;

cooperating means on said stand and one end of said spindle restricting rotation of said spindle in one direction, said cooperating means comprising a plurality of stop members in spaced circumferential relation to one another on said one end of said spindle, and a spring-loaded pin located in said stand in facing relation to said stop members, and means biasing said pin to travel yieldingly over said stop members when said spindle is rotated in a first direction



and, when rotated in the opposite direction, to abut said stop members to prevent further rotation; and

photograph-receiving jackets mounted on said annular tracks, each said jacket having slidable connector means for slidably connecting said jackets to said tracks.

4,599,816

APPARATUS FOR ILLUMINATING PASSIVE LIQUID CRYSTAL DISPLAYS (LCD'S)

Wolfgang Ziegler, Fürth, and Hans Petermann, Nuremberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

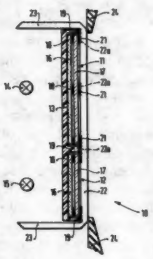
PCT No. PCT/DE83/00221, § 371 Date Dec. 7, 1984, § 102(e) Date Dec. 7, 1984, PCT Pub. No. WO84/04382, PCT Pub. Date Nov. 8, 1984

PCT Filed Dec. 24, 1984, Ser. No. 686,258

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314631

Int. Cl.⁴ G09F *13/22*

U.S. Cl. 40—544 **11 Claims**



1. A passive liquid crystal display (**10**) having bright display elements and a darker, homogeneously bright background, comprising

at least one liquid crystal cell (**11, 12**) including liquid crystals retained between plates (**16, 17**), said liquid crystals forming said bright display elements when electrically triggered and incompletely dark background areas when not triggered;

a plurality of support elements (**18**) spacing said plates (**16, 17**) from each other;

a plurality of masks (**21**) disposed between a viewer (**20**) and said at least one cell (**11, 12**) and absorbing light emanating from said support elements (**18**), thereby producing substantially completely dark background areas;

wherein, in accordance with the invention,

means (**22, 22*a***) are provided, between said display (**10**) and said viewer (**20**), for equalizing the brightness of said incompletely dark and said completely dark background areas to produce a homogeneously bright background,

said means including a photoconductor (22) transmitting light not emanating from said at least one liquid crystal cell (11, 12) to a surface region (22*a*) of said photoconductor (22) disposed between each said mask (21) and said viewer (20) and directing said light from each surface region (22*a*) outward toward the viewer (20).

4,599,817

SIGNAL PISTOL

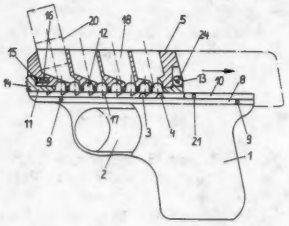
Eberhard Scheible, Geislingen, Fed. Rep. of Germany, assignor to EM-GE Sportgerate GmbH & Co., KG, Gussenstadt, Fed. Rep. of Germany

Filed Feb. 21, 1984, Ser. No. 582,173

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307083

Int. Cl.⁴ F41C *3/02, 25/00*

U.S. Cl. 42—1.15 **5 Claims**



1. A signal rocket for repeated firing of a plurality of signal rockets without reloading the pistol which comprises a handle provided with a base member at its upper end; a trigger in said handle; a firing pin and a transport latch in said base member; a magazine slide adapted to be seated on said base member and to be transported along the longitudinal axis thereof; two parallel rows of oppositely positioned bores in said magazine slide extending longitudinally thereof for receiving signal rockets; a magazine positioned below said magazine slide provided with a plurality of cartridge seating means equivalent in number to the number of bores in said magazine slide, said plurality of seating means being in a single row extending along the longitudinal axis of said magazine slide with each seating means being connected by an obliquely inclined flash hole to a bore in a row of bores opposite to the row to which the seating means adjacent to it is connected; and means associated with said magazine and cooperating with said transport latch whereby said magazine together with said magazine slide can be progressively moved rearwardly along the longitudinal axis of said base member so as to successively bring each cartridge seating means in contact with said firing pin thereby permitting repeated firings of signal rockets from said bores in said magazine slide.

4,599,818

MAGAZINE CATCH

Joseph Fedora, Palmer, and Fred Zajechowski, Granby, both of Mass., assignors to Bangor Punta Corporation, Greenwich, Conn.

Filed Aug. 24, 1983, Ser. No. 525,865

Int. Cl.⁴ F41C *27/00*

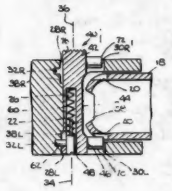
U.S. Cl. 42—7 **10 Claims**

1. A magazine catch for a pistol having a handle for receiving a magazine, a seat in the handle for receiving the catch, and a locking groove on each of the opposite sides of the seat, the magazine having magazine retaining slots along opposite sides thereof, comprising:

a generally elongated catch body having a projection at one end thereof for engagement with the magazine in one of its slots to retain the magazine in the handle of the pistol,

a member carried by said body for axial slidable movement relative thereto and having a locking arm projecting generally laterally therefrom for engagement in one or the other of the locking grooves carried by the seat of the handle to retain the catch in the handle, said member being rotatable relative to said body and said locking arm being displaceable from the locking groove upon rotation of said member relative to said body,

spring means cooperable between said body and said member for biasing said body and said member for axial movement in a direction away from one another to locate the projection in engagement with one of the magazine slots, said body being axially movable relative to said member against the bias of said spring means to displace the projection from the one magazine slot and thereby release the magazine from the handle, and



means for displacing the arm from the locking groove to enable removal of the catch from the seat.

4,599,819

DECOY DABBLER

Alan M. Voges, Jr., 1614 Fairy Dell Tr., and Gregory L. Voges, Voges Apt. #8, both of Lookout Mtn., Tenn. 37350, assignors to Greg Voges and Alan Voges, both of Lookout Mtn., Tenn.

Filed Oct. 28, 1985, Ser. No. 791,794

Int. Cl.⁴ A01M *31/06*

U.S. Cl. 43—3 **1 Claim**

1. In combination a duck decoy and a decoy moving device comprising:

an encased extendable and retractable spring;

an anchor line attached to one end of said spring for anchoring said spring beneath the surface of a body of water;

a decoy pulling line attached at one of its ends to the other end of said spring;

at least one duck decoy fixedly attached to a mid-portion of said decoy pulling line and floating in the surface of said body of water;

a handle attached to the other end of said decoy pulling line and positioned obove the surface of said body of water;

wherein a pulling force applied to said handle causes said spring to extend and retract producing life-like movement of said duck decoy.

4,599,820

METHOD AND APPARATUS FOR SELECTING FISHING LURE COLOR

Loren G. Hill, 2826 Castlewood, Norman, Okla. 73069

Filed Oct. 26, 1984, Ser. No. 665,543

Int. Cl.⁴ A01K *97/00*

U.S. Cl. 43—4.5 **18 Claims**

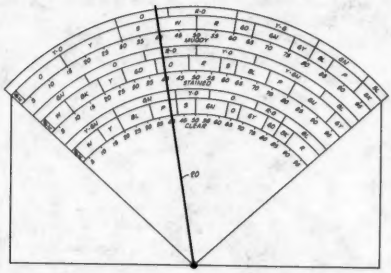
2. The method of catching fish which comprises:

observing the clarity of the water to be fished to determine whether the water is clear, stained or muddy;

measuring the light transmittance at the depth in the water where the fishing lure is to be placed; then

selecting the color of lure to be used by matching the observed water clarity and the measured light transmittance with a lure color which has previously been determined to be the most effective lure color to use under the light transmittance and observed water clarity condition, the matching of the observed water clarity and measured light transmittance with a lure color being accomplished by:

swinging pointer means through an arc in response to the measured light transmittance, so that the magnitude of the swing of the pointer means is directly proportional to the magnitude of the light transmittance measured; and



arranging colors on a chart placed adjacent and parallel to the plane in which the pointer means swings, each of said colors being placed at one or more specific locations on the chart which is determined by

(a) the place on the chart to which the pointer means will point when the pointer means responds to a specific magnitude of measured light transmittance; and

(b) at least one predetermined water clarity condition at which a bass fish will see the respective specific color better than other colors when located in water of said one predetermined water clarity condition with the light transmittance value at the location of the bass fish being substantially equivalent to said specific magnitude of measured light transmittance.

4,599,821

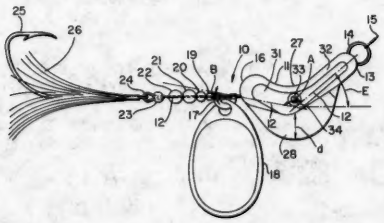
FISHING LURE

James E. Martin, 10700 Calico La., Chardon, Ohio 44024

Filed Jun. 18, 1985, Ser. No. 746,136

Int. Cl.⁴ A01K *85/00*

U.S. Cl. 43—42.46 **14 Claims**



1. A fishing lure, comprising a weighted body which is symmetrical about a centerplane which vertically bisects the body when the body is in an upright position, the body having, (i) a generally U-shaped topside, (ii) a mouth end in spaced relation from a tail end, (iii) a downwardly curved keel extending from the tail end and terminating short of the mouth end, the mouth end of the body having opposing longitudinal sides which flare outwardly from the centerplane of the body in a direction away from the tail of the body to form fixed planes above and below which water passes to help stabilize movement of the body through the water.

4,599,822

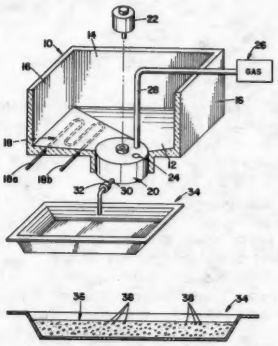
VERMIN TRAP

Stanley Z. Baker, 3115 Bremerton Rd., Pepper Pike, Ohio 44124

Filed Apr. 12, 1983, Ser. No. 484,275

Int. Cl.⁴ A01M *1/14*

U.S. Cl. 43—114 **20 Claims**



1. In a vermin trap of the character comprising a layer of pressure sensitive adhesive and means to support said layer of adhesive, the improvement comprising: said layer of adhesive having gas bubbles trapped therein, said gas bubbles providing for a given quantity of said adhesive to weigh from about 20% to about 40% less than the same quantity without bubbles.

4,599,823

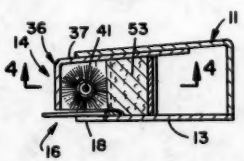
FLEA CATCHER

Jin G. Lee, 718 34th Ave., San Francisco, Calif. 94121

Filed May 21, 1984, Ser. No. 612,709

Int. Cl.⁴ A01M *3/00*

U.S. Cl. 43—134 **5 Claims**



1. A flea catcher for removing insects from the hair animals and exterminating same comprising

a housing having an open front,

a comb having teeth extending from the open front of said housing,

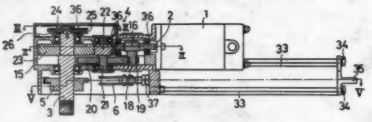
a roller having bristles, rotatably mounted across the open front of said housing for engagement with teeth of said comb and rotatable by engagement with hair being combed, and

means adapted for impregnation with insecticide disposed across said housing immediately behind said roller.

4,599,824
DEVICE FOR AUTOMATICALLY OPENING AND CLOSING HINGED DOOR

Wataru Mitsuhashi, Kobe; Kouji Kaminaka, Akashi, and Kaname Kotani, Kobe, all of Japan, assignors to Nippon Air Brake Co., Ltd., Kobe, Japan

Filed May 7, 1985, Ser. No. 731,284
Claims priority, application Japan, Nov. 26, 1984, 59-249981
Int. Cl.[4] E05B *65/10*; E05F *15/12*
U.S. Cl. 49—141 **5 Claims**

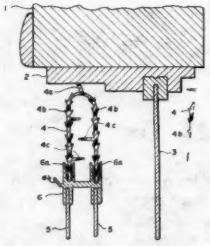


1. A device for automatically opening and closing a hinged door, comprising:
(a) a motor having a drive shaft;
(b) a speed reducer;
(c) an operating shaft adapted to be connected to the hinged door and operatively coupled through said speed reducer to said drive shaft;
(d) a chain sprocket fixed to said operating shaft;
(e) a chain trained in mesh around said chain sprocket;
(f) a first rod having an end coupled to an end of said chain, with a first flange fixed to an opposite end of said first rod;
(g) a second rod having an end coupled to an opposite end of said chain, with a second flange fixed to an opposite end of said second rod;
(h) a first tubular body in which said first rod is axially movably disposed;
(i) a first spring disposed around said first rod within said first tubular body for normally urging said first flange in a direction away from said chain sprocket;
(j) a second tubular body in which said second rod is axially movably disposed; and
(k) a second spring disposed around said second rod within said second tubular body for normally urging said second flange in a direction away from said chain sprocket.

4,599,825
INTERIOR STORM WINDOW

Thomas Sixsmith, 22016 Buenaventura St., Woodland Hills, Calif. 91364

Filed Aug. 14, 1985, Ser. No. 765,584
Int. Cl.[4] E06B *7/18*
U.S. Cl. 49—466 **8 Claims**

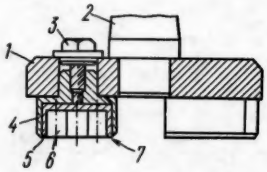


1. In combination with a window frame, an interior storm window having a rigid frame extending about the perimeter of the window, the outer edge of said frame having a pair of parallel slots, a sealing edge of flexible plastic sheet material of variable width having an inverted elongated "U" cross-section with one-way acting projections extending downwardly on the outer surface of each leg of the inverted "U", said slots being correspondingly shaped to form a one-way locking fit with the lower extremeties of said inverted elongated "U" sealing edge, whereby the width of said sealing edge may be varied by cutting off said lower extremities of said sealing edge and substituting the remaining lowermost projections for locking engagement in said slots.

4,599,826
DEVICE FOR MAGNETOABRASIVE MACHINING OF WORKPIECES

Georgy A. Podoprigora, Kiev, U.S.S.R., assignor to Institut Sverkhtverdykh Materialov Akademii Naukukrainskoi SSR, Kiev, U.S.S.R.

Filed Mar. 5, 1984, Ser. No. 585,997
Int. Cl.[4] B24B *37/00*; B24D *7/00*
U.S. Cl. 51—71 **1 Claim**



1. A device for magnetoabrasive machining of workpieces, obtaining drive from a rotary mechanism, and comprising:
a carrier of nonmagnetic material;
means for fixing said device on a shaft of said rotary mechanism, said fixing means being associated with said carrier;
at least one permanent magnet situated on said carrier and formed as a bank composed of a plurality of magnetic elements, at least four in number, each of said magnetic elements having an axis of magnetization and having at least two adjacent intersecting side surfaces contacting respective side surfaces of two other ones of said magnetic elements, said magnetic elements being so arranged in each of said banks that the polarity of their poles lying on the axes of magnetization, alternates staggerwise, and each of said banks of magnetic elements being mounted in a rotatable holder for changing the angular position of said bank of magnetic elements on the carrier with respect to a vector of peripheral velocity of said device; and
magnetic circuits equal in number to said banks of magnetic elements, said magnetic circuits being secured on said carrier and carrying said banks of magnetic elements.

4,599,827
METALLOGRAPHIC PREPARATION OF PARTICULATE FILLED ALUMINUM METAL MATRIX COMPOSITE MATERIAL

Eugene L. Goodwin, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 24, 1985, Ser. No. 747,741
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—326 **6 Claims**

1. A method for preparing particulate filled aluminum metal matrix composite material for quality determination comprising, mounting a sample of the material that is to be prepared in a plastic material, rough grinding the sample on a belt surfacer that has a grinding surface of silicon carbide with water and water soluable oil as a lubricant thereon and rough grinding the sample until the surface is relatively flat and with relatively large imperfections removed, fine grinding the sample on a pregrinder that has four paper grit sizes with progressively

smaller grit of silicon carbide for each step of the fine grinding and with water flowing over the silicon carbide, moving said sample back and forth on the first and coarsest grit silicon carbide paper to remove scratches on the surface of the sample and moving to the second, third and fourth grit papers and moving the sample back and forth thereon with the sample being rotated 90 degrees each time it is moved from the first, second and third grit paper to the next grit paper, running water over the sample after each fine grinding step, rough polishing said sample on a flat aluminum wheel covered with a woven nylon polishing cloth with about three micron diamond bort paste thereon and lapping oil as a lubricant and polishing said sample for about 20–30 seconds at a wheel speed of about 300/400 rpm, cleaning said rough polished sample in liquid

detergent and running water, and final polishing of said sample using three final polishing steps in which the first final polishing step uses the coarsest grinding compound with a lubricant on a wheel to polish the sample, polishing the sample in a second polishing step using a grinding compound of a finer material than that used in the first final polishing step and utilizing detergent as a lubricant for the grinding compound with polishing being done on a wheel, and polishing the sample in a third step of final polishing in which the sample is polished on a wheel covered with a microcloth impregnated with a slurry of distilled water and commercial grade magnesium oxide with the polishing in this step being done for about 2 to about 5 minutes at a wheel speed of about 150/250 rpm to produce a sample that is ready for microscopic examination.

4,599,828

TILE HAVING NOZZLE AND MEANS FOR FIXATION THEREOF TO A ROOF

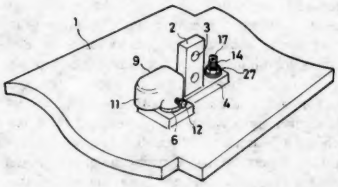
Nanako Ishikura, 15-9, Enkohjihonmachi, Kanazawa-shi, Ishikawa-ken, Japan (921)

Filed Apr. 4, 1985, Ser. No. 719,813

Claims priority, application Japan, Apr. 4, 1984, 59-50010[U]; Apr. 4, 1984, 59-50011[U]

Int. Cl.⁴ E04D *1/34*

U.S. Cl. 52—19 **6 Claims**



1. A roof tile having a lead-in hole for securing antenna cords or other elongated bodies of rooftop fixtures to a roof board, comprising:

a tile body,

a pedestal integrally formed on an upper central surface of said tile body and having a hole bored therein so as to pierce through said tile body,

an anchor bolt inserted into the tile body so as to fix said tile body to the roof board,

a nozzle integrally formed on said pedestal so as to project upwardly and having an annular rib formed on an upper periphery thereof and a hole formed therein as said lead-in hole so as to pierce through said pedestal and said tile body, and

a pipe joint composed of a base which is adapted to be fitted around said nozzle and fixed to said nozzle and brought into contact with a periphery of said nozzle at a position below said annular rib.

4,599,829

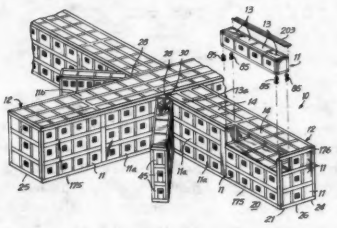
MODULAR CONTAINER BUILDING SYSTEM

John M. DiMartino, Sr., Bayport, N.Y., assignor to Tandemloc, Inc., Bayport, N.Y.

Filed Aug. 25, 1983, Ser. No. 526,473

Int. Cl.⁴ E04B *1/35*

U.S. Cl. 52—79.7 **31 Claims**



1. A building system comprising:

a plurality of similarly sized shipping container units, wherein each unit comprises functional components for a specific living environment function, and each unit being formed with a fitting at each respective corner of each unit, and mounting connectors being formed so as to be disposed between upper and lower container units and having means to vertically interconnect the fittings of said upper and lower container units further comprising a second plurality of units mounted adjacent said first plurality and means to horizontally interconnect said pluralities, and wherein substantially the entire building load bearing stress is taken in the vertical direction through the fittings and mounting connectors and wherein at least one unit is a hallway unit, said hallway unit being formed so as to provide common access between other horizontal interconnected units, wherein the horizontal connection means comprises a plate being formed at oppositely disposed ends with means for engaging adjacent units so as to provide a walkway between the units, and means to supportively mount said plate between and with said adjacent units, whereby upon interconnection of said fittings and walkways a multiple storey building is formed with common access provided by the hallway unit between specific living environmental function units.

4,599,830

ENERGY SAVING BUILDING AND METHOD OF CONSTRUCTING SAME

James Nawrot, P.O. Box 152, Gaylord, Mich. 49735

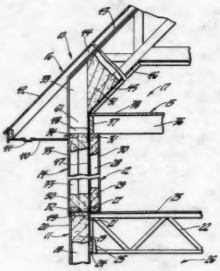
Filed Jun. 4, 1984, Ser. No. 617,105

Int. Cl.⁴ E04B *7/02*

U.S. Cl. 52—90 **16 Claims**

1. An energy saving building, comprising, in combination, a ground supported foundation assembly, said foundation assembly including a first story floor; an inner wall assembly sup-

ported by said foundation assembly; a second floor joist assembly supported by said inner wall assembly; an outer wall assembly spaced a predetermined distance from said inner wall assembly so as to substantially surround said inner wall assembly; a roof assembly supported by said outer wall assembly so as to substantially cover said inner wall assembly; a substantially continuous vapor barrier having outside and inside surfaces positioned so as to separate said inner wall assembly said second floor joist assembly from both said outer wall assembly and said roof assembly, said vapor barrier being positioned so



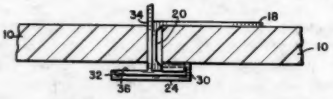
that not more than one-third of the R-factor which separates the inner atmosphere inside said building from the outer atmosphere outside said building is situated inside said vapor barrier; and connection means for securing said outer wall assembly both to said roof assembly and also through said vapor barrier to said inner wall assembly whereby said outer wall assembly supports said roof assembly in a predetermined position outside of said vapor barrier and said inner wall assembly supports said second floor joist assembly inside said vapor barrier and said vapor barrier is inside the dew point between said inner atmosphere and said outer atmosphere.

4,599,831

CEILING PANEL SECURITY CLIP DEVICE

George H. Magaha, Jr., Pasadena, Md., assignor to Economy Distributors, Inc., Glen Burnie, Md.

Filed Dec. 24, 1984, Ser. No. 685,740
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—98 15 Claims



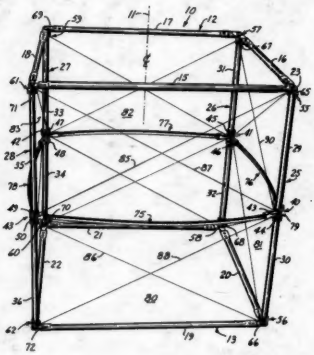
1. A security device for securing a respective ceiling panel to a framework support therefor, wherein the support includes a substantially horizontal flange member having respective longitudinal side edges, one of which is disposed beneath the respective ceiling panel, and the other of which is remote from the respective ceiling panel, and wherein the panel has a bottom face, comprising a clip-on means for removably engaging an edge portion of said respective ceiling panel in the vicinity of said framework support, a removable holding means completely separate from the clip-on means and engaging a portion of said clip-on means and at least the other remote edge of said framework support with an interference fit therebetween, thereby securing said clip-on means to said framework, and the holding means including flange means wedged between the bottom face of the panel and the horizontal flange member on the support.

4,599,832

EXTENDIBLE STRUCTURES

Max D. Benton, 175 Salisbury, and William M. Robbins, Jr., 1540 Holliday Hill Rd., both of Goleta, Calif. 93117

Filed Jan. 4, 1985, Ser. No. 688,795
Int. Cl.[4] E04H 12/18, 12/34
U.S. Cl. 52—118 25 Claims



1. An extendible structure having an axis of extension, said structure comprising:

a plurality of axially spaced-apart station members, each said station member being rigid, and lying in a plane normal to said axis;

at least three longeron members, each said longeron member comprising a pair of rigid longeron elements, first joint means joining first ends of the elements of each pair of longeron elements to one another for foldable movement relative to each other, and second joint means joining second ends of said longeron elements to respective station members for foldable movement relative to said station member;

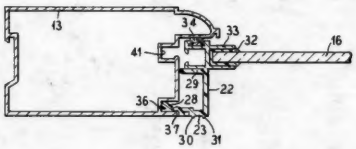
a buckling spring which buckles resiliently and arcuately as an Euler column under end load compression, connected to and between each pair of adjacent first joint means whereby to bias said first joint means away from each other, with a resultant force on each first joint means directed outwardly away from said axis, said station members and adjacent longeron members, when all joint means respective to each pair of joined longeron elements are aligned, forming a respective side panel; and

a pair of first stay members, and a pair of second stay members for each said panel, all of said stay members having a maximum length when fully stretched by tension forces, each one of each pair of said first stay members extending from its respective first joint means of one longeron member to a respective second joint means of the adjacent longeron member of that panel, converging in the direction of fold of said longeron elements, each one of each pair of said second stay members extending from a respective second joint means of said adjacent longeron member to the first joint means of the first-mentioned longeron member, at least said second stay members being non-rigid with respect to endwise compressive forces.

4,599,833
INSERT RETAINER FOR STORM DOOR

Robert E. Bullock, Malvern, Ark., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Jun. 5, 1984, Ser. No. 617,513
Int. Cl.[4] E04B 1/40
U.S. Cl. 52—127.5 2 Claims



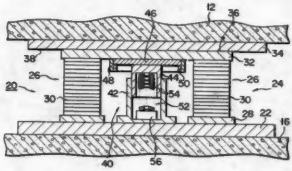
1. A storm door assembly, having an inner side, comprising:
a frame having vertical and horizontal frame members defining an opening, said vertical frame members each having a vertically extending rectangular channel extending therealong formed with an inwardly facing bead,
a window structure, having an interior, proportioned to be received in said opening, and an insert retainer for securing said window structure within said frame members in readily releasable engagement, said retainer comprising:
a one-piece flexible peel-out type strip composed of a resiliently compressible resinous material and having a generally flat first web portion,
a second web portion, having an underside and a bottom, extending from one end of said first web portion at a right angle thereto,
a third web portion parallel to said second web portion, said three web portions forming an open-ended channel,
an arcuate integral hinge forming an extension of said second web portion, said hinge engaging said inwardly facing bead, and
an end portion extending outwardly from said integral hinge at an obtuse angle to said second web portion, said end portion being wedged diagonally into said channel in tightly fitting relation, thereby compressing said hinge securely about said bead,
said strip having a groove therein parallel to said integral hinge and located in said second web portion parallel to said third web portion, said groove being accessible from the interior of said window when said window is received in said frame permitting release from said channel by insertion therein of a screwdriver or the like, said strip having sufficient inherent flexibility to be snapped into said channel where it is held by its natural resiliency.

4,599,834
SEISMIC ISOLATOR

Shigeru Fujimoto; Satoshi Ohte; Hirofumi Kondo; Takuji Matsumoto, all of Yokohama, and Takafumi Fujita, Chiba, all of Japan, assignors to Kabus:iki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1984, Ser. No. 665,159
Claims priority, application Japan, Oct. 27, 1983, 58-201294
Int. Cl.[4] E04H 9/02
U.S. Cl. 52—167 11 Claims

1. A seismic isolator, disposed between a structure and a foundation, for decreasing earthquake vibrations to be transmitted to the structure, comprising:
a first sliding plate fixed on a lower surface of the structure and having a lower surface as a first sliding surface;
a second sliding plate having a second sliding surface brought into slidable contact with the first sliding surface of the first sliding plate;
first supporting members disposed between the second sliding plate and the foundation and having at least horizontal elasticity, the first supporting members having a lower end fixed on the foundation and an upper end fixed on a lower surface of the second sliding plate;
second supporting members disposed between the second sliding plate and the foundation to be dynamically parallel to the first supporting members and having elasticity only along a vertical direction, the second supporting members having a lower end fixed on the foundation and an upper end brought into tight contact with a lower surface of the second sliding plate, and the second sliding plate having

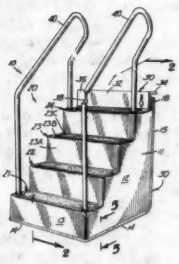


the second sliding surface slidable on the upper end of the second supporting members, the frictional force required for the relative sliding between the first and second sliding plates being designed to be greater than that required for the relative sliding between the second sliding plate and the upper surface of the second supporting members;
adjusting and holding members for adjusting an urging force acting on the lower surface of the second sliding plate through the upper end of the second supporting members.

4,599,835
INSERTABLE SWIMMING POOL STEP ASSEMBLY

Robert M. Rinke, Moorhead, Minn., assignor to Adventure Enterprises, Inc., Fargo, N. Dak.

Filed Nov. 18, 1985, Ser. No. 798,992
Int. Cl.[4] E04F 11/00; E04H 3/16
U.S. Cl. 52—184 12 Claims



1. An insertable step assembly for a swimming pool comprising:
(a) a frame comprising a unitary assembly of a plurality of steps connected in an end-to-end fashion, terminating at a top end and having bottom edges for supporting the frame on a bottom surface of a swimming pool;
(b) vertically adjustable step means mounted on the top end of the frame and having a horizontal tread that extends over the top edge of a swimming pool in which the frame is placed, and means for adjustably securing the step means to the frame;
(c) means for providing ballast secured to the bottom step of the frame; and
(d) a pair of handrails, one of each secured to each side of the frame.

4,599,836

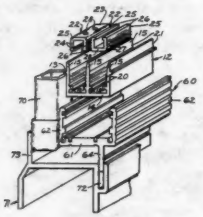
SELF-STORING WINDOW ASSEMBLY

Randy Melcher, 702 N. Helena, Spokane, Wash. 99202

Filed Jun. 20, 1985, Ser. No. 747,164

Int. Cl.[4] E06B *3/26*

U.S. Cl. 52—202 **9 Claims**



1. A self-storing window assembly, comprising:

a support frame;

a group of four elongated channel members each having an identical cross-sectional shape and arranged in an enclosed rectangular configuration including two parallel side channel members and two parallel end channel members extending perpendicularly between their respective ends;

each channel member having a base and three substantially parallel walls projecting perpendicularly to one side of the base, the base and walls having inner surfaces forming inner and outer U-shaped open tracks each adapted to receive window sash edges;

a plurality of elongated track fillers having outer surfaces complementary to the open tracks, the track fillers being adapted to be removably positioned within the tracks of a channel member;

a first sash having side edges engaged between a first set of track fillers located respectively within the outer tracks of the side channel members at opposed sides of the frame, said first sash having first and second parallel end edges perpendicular to the side channel members, the first end edge of said first sash being normally positioned within the outer track of one of said end channel members; and

a second sash having side edges engaged between a second set of track fillers located respectively within the inner tracks of the side channel members at opposed sides of the frame, said second sash having first and second parallel end edges perpendicular to the side channel members, the first end edge of said second sash being normally positioned within the inner track of the remaining one of said end channel members, and the second end edge of said second sash being overlapped by the second end edge of said first sash.

4,599,837

LOG JOINING CONFIGURATION

Ronald A. Wrightman, P.O. Box 268, Minden, Ontario, K0M 2K0, Canada

Continuation of Ser. No. 269,354, Jun. 1, 1981, abandoned. This application Sep. 13, 1983, Ser. No. 531,586

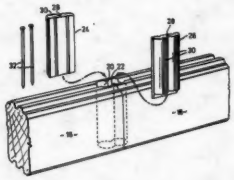
Int. Cl.[4] E04B *1/10*; E04C *1/10*

U.S. Cl. 52—233 **3 Claims**

1. Butt joinable log members each having a butting surface disposed in abutting relation with the butting surface of the other in the construction of a wall;

a channel with an opening and with opposed side walls that diverge from the opening and extend fully across the butting surface of each log member, the openings of the channels of the butting surface facing each other with the longitudinal axes of the channels in parallel relation;

a pair of co-operating locking members each having a longitudinally extending locking surface and a wedging surface on the opposite side to the locking surface, the locking surface extending for the full length of said channels and being rigid and complementary to a portion of the side wall of the channel of each log member adjacent the openings of the channels where they diverge as aforesaid when the log members are in abutting relation; the portion of the locking surface of the locking member that is complementary to said portion of one channel being spaced from the portion of the locking surface that is complementary to said portion of the other channel a distance to maintain said logs in abutting relation as aforesaid;



the locking members having a thickness between their locking surface and their wedging surface to permit the pair of locking members to be inserted into the openings of the channels of butted log members with their wedging surfaces in face to face relation;

and a positioned in each of the channels wedged between the wedging surfaces of the locking members in a direction substantially parallel to the longitudinal axes of the channels to force the locking surfaces thereof apart and into close locking relation with the sides of the channels of the log members to draw and maintain the log members in abutting relation.

4,599,838

JOINT ASSEMBLY OF HORIZONTALLY OPPOSED CURTAIN WALL UNITS

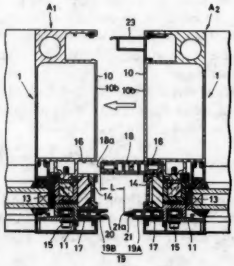
Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,334

Claims priority, application Japan, May 13, 1983, 58-70436[U]

Int. Cl.[4] E04B *2/88*; E04H *1/00*

U.S. Cl. 52—235 **2 Claims**



1. A joint assembly of two adjacent curtain wall units having respectively a horizontally opposed pair of first and second vertical frame members, comprising:

(a) the first and second vertical frame members each having respectively a first and a second vertical recess, said first and second vertical recesses of the first vertical frame member being opposite respectively to the corresponding first and second recesses of the second vertical frame member;

(b) an exterior gasket composed of a pair of male and female halves having interfitting edges, each of said male and female gasket halves having a base fitted in said second recess of a respective one of the first and second vertical frame members;

(c) an interior gasket having opposite edge portions fitted in the opposite first recesses of said interior parts of the first and second vertical frame members, each of the opposite edge portions of said interior gasket projecting beyond said interfitting edges of said male and female gasket halves in an edgewise direction of the curtain wall units;

(d) said male gasket half having along said edge thereof a longitudinal tongue, and said female gasket half having along said edge thereof a longitudinal groove receiving said tongue, one of the opposite edge portions of said interior gasket projecting beyond a distal edge of said tongue of said male gasket half; and

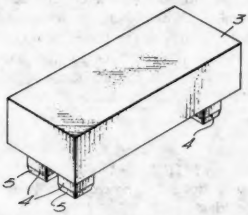
(e) the extent to which each said edge portion of said interior gasket projects beyond said interfitting edges of said male and female gasket halves being smaller than half the length of said interior gasket and larger than the length of each said edge portion.

4,599,839

IMPROVEMENT IN CEILING BLOCKS

Snitovski Jacov, 17 Bialik Street, Ramat Hasharon, Israel

Filed Nov. 29, 1982, Ser. No. 445,279
Claims priority, application Israel, Dec. 7, 1981, 64463
Int. Cl.⁴ E04B *5/36*
U.S. Cl. 52—309.12 **5 Claims**



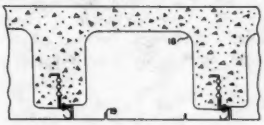
1. Ceiling block construction for an in situ assembly comprising bottom parts and top parts, said bottom parts being precast from concrete or like material, each bottom part being of a rectangular configuration with planar exterior side and end walls, each bottom part having a first dimension defined between and inclusive of the opposed planar end walls, and a second dimension defined between and inclusive of the opposed planar side walls, each bottom part also including top and bottom faces, said planar exterior walls being projection-free for the full height thereof between the top and bottom faces, a plurality of depressions formed in the top face of each bottom part inward of said planar walls and defined by planar sides forming corners therebetween, said depressions terminating inward of said bottom faces, and at least one transverse interior wall, said bottom parts being assemblable with the top faces coplanar and with selected exterior walls in wall-to-wall abutment for the full height thereof to define a continuous extent equal to the combined width and length of adjacent bottom parts, said top parts being of foamed plastic and having a rectangular configuration with planar exterior side and end walls, each top part having a first dimension defined between and inclusive of the opposed planar end walls thereof and equal to the first dimension of said bottom parts, said top part further including a second dimension defined between and inclusive of the opposed planar side walls thereof and being of a length at least equal to twice that of the second dimension of a bottom part whereby each top part overlies multiple bottom parts, each top part having a plurality of integral depending projections receivable within corners of the depressions of each underlying bottom part to preclude lateral and longitudinal movement therebetween, the projections being so oriented as to align opposed end walls of the top parts with opposed end walls of the bottom parts to define continuous planar end surfaces, said concrete bottom parts stabilizing and positioning said foamed plastic top parts.

4,599,840

CASSETTE FOR CASTING OF FRAMEWORK

Lars I. Ingvarsson, and Jonathan A. Ramsden, both of Borlänge, Sweden, assignors to Dobel AB and Stalbyggnadsinstitutet, Borlänge, Sweden

PCT No. PCT/SE83/00487, § 371 Date Aug. 20, 1984, § 102(e) Date Aug. 20, 1984, PCT Pub. No. WO84/02734, PCT Pub. Date Jul. 19, 1984
PCT Filed Dec. 30, 1983, Ser. No. 642,679
Claims priority, application Sweden, Jan. 3, 1983, 8300013-3
Int. Cl.⁴ E04B *1/16, 5/18, 5/19*
U.S. Cl. 52—340 **10 Claims**



1. A cassette for use as a lost form when casting concrete therein, said cassette comprising:

a generally rectangular bottom panel which, when said cassette is positioned for use, extends in a first generally horizontal plane, said generally rectangular bottom panel having opposite first and second elongated side edges, and

first and second side walls respectively connected along the length of the first and second side edges of said generally rectangular bottom panel, thus defining inner and outer directions of said cassette,

said first side wall comprising a first flange which is connected to said first side edge of said generally rectangular bottom panel and which extends upwardly from said bottom panel in a first generally vertical plane; a second flange which is connected to said first flange and which extends outwardly of said cassette in a second generally horizontal plane; a third flange which is connected to said second flange and which extends upwardly in a second generally vertical plane, said third flange including vertically spaced apart curved portions which bulge inwardly of said cassette along the length of said third flange; and a fourth flange which is connected to said third flange and which extends outwardly of said cassette in a third generally horizontal plane,

said second side wall comprising a fifth flange which is connected to said second side edge of said rectangular bottom panel and which extends upwardly from said bottom panel in a third generally vertical plane; a sixth flange which is connected to said fifth flange and which extends inwardly of said cassette in a fourth generally horizontal plane; a seventh flange which is connected to said sixth flange and which extends upwardly in a fourth generally vertical plane, said seventh flange including vertically spaced apart elongated curved portions which bulge along the length of said seventh flange and inwardly of said cassette; each of said elongated curved portions of said seventh flange being located above said generally rectangular bottom panel at a height equivalent to the height above the generally rectangular bottom panel of the elongated curved portions of said third flange; and an eighth flange which extends inwardly of said cassette in a fifth generally horizontal plane.

4,599,841

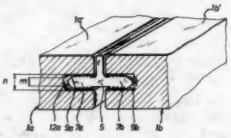
PANEL STRUCTURE COMPRISING BOARDS AND FOR INSTANCE SERVING AS A FLOOR OR A PANEL

Peter Haid, Älmhult, Sweden, assignor to Inter-Ikea AG, Luzern, Switzerland

Filed Apr. 6, 1984, Ser. No. 597,659
Claims priority, application Denmark, Apr. 7, 1983, 1545/83
Int. Cl.⁴ E04C *1/10*
U.S. Cl. 52—403 **5 Claims**

1. In combination: a first board having a first edge, a second

board having a second edge opposite said first edge, each edge being provided with a smooth groove near the middle of the thickness of each board, the groove in one edge being located opposite the groove in the other edge, each of said grooves being defined by first and second spaced apart surfaces and a further groove means located between said first and second surfaces for catching debris, said second surface being larger than said first surface, said boards each including a first beveled edge located adjacent to said second surface, a recess means defined in said first board adjacent to said smooth groove first surface and extending longitudinally of said first board, and a second beveled edge on said first board adjacent to said recess means and a molding means for joining said first board to said second board, said molding means being of T-shaped cross section and having a first web means between said edges, and having a height sufficient to extend to a location



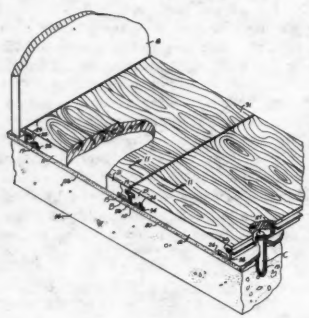
adjacent to the top surfaces of the two boards for placing a first web means top surface in the plane of said board top surfaces, and second and third web means connected to said first web means and extending therefrom and respectively received in said grooves, said recess means capturing said second web means during joining of said boards, each of said second and third web means being received in the grooves and being provided with teeth means on one side of each of said second and third web means for frictionally and slidably engaging the boards in said grooves to permit movement of said boards relative to teach other which is permitted and controlled by said teeth means and by all of said web means, the width of said grooves being slightly smaller than the thickness of said web means, said molding means being formed of a relatively soft resilient material.

4,599,842

PLANAR SECTION FASTENING SYSTEM

James Counihan, Rte. 4, Box 225-A, Blakely Ave., Piedmont, S.C. 29673

Filed Aug. 20, 1984, Ser. No. 642,073
Int. Cl.[4] F04B *1/38;* F04C *1/10;* F16B *35/04*
U.S. Cl. 52—586 **15 Claims**



8. A flooring and fastening system for attaching planar sections of flooring and the like to a base surface wherein the rectangular planar sections are the type having a top surface, a bottom surface, a first end and a second end; the top and bottom surfaces being substantially parallel to one another and the end surfaces being substantially parallel to one another; groove means for adjoining said first and second ends of adjacent planar sections together; said system comprising:

each of the planar sections having on the bottom surface two rabbets that extend transversely across the width of the planar section, one of the rabbets being adjacent the first end and the other rabbet being adjacent the second end, each of the two rabbets having two vertical sides and one horizontal side;

fastening strips for fastening the planar sections to the base surface having an attachment base means, and interlocking tongue means for interlocking with said groove means of said first and second ends;

a layer of resilient material interposed between the fastening strips and the base surface providing cushioning for the planar sections;

fastening members having heads for attaching the fastening strips to the resilient material and the base surface;

a clearance space between said horizontal side of said rabbet and said head of said fastening members to allow said planar sections to move downwardly under load against said resilient material; and

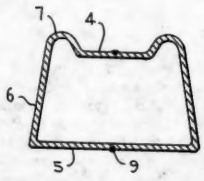
each said fastening member having a forward enlarged shank element for penetrating the fastening strips and a reduced shank portion adjacent the head of said fastening member for fastening said fastening strips, said reduced shank being reduced in diameter relative to said enlarged shank element allowing said attachment base means to move freely relative to the fastening member on the resilient material interposed between the fastening strip and the base surface, thereby providing more uniform cushioning characteristics for the floor system.

4,599,843

VEHICLE SAFETY BAR

Lars Ingvarsson, Börlange, Sweden, assignor to Dobel AB, Börlange, Sweden

PCT No. PCT/SE82/00264, § 371 Date Sep. 21, 1983, § 102(e) Date Sep. 21, 1983, PCT Pub. No. WO83/02575, PCT Pub. Date Aug. 4, 1983
PCT Filed Aug. 19, 1982, Ser. No. 541,339
Claims priority, application Sweden, Feb. 1, 1982, 8200530
Int. Cl.[4] E04C *3/32, 3/04;* E06B *3/00*
U.S. Cl. 52—729 **10 Claims**



1. An elongated safety bar which is resistant to lateral deformation in a collision, said elongated bar including first and second spaced apart flanges which extend the length of said safety bar and first and second webs which extend the length of said safety bar, the first and second webs respectively interconnecting the associated sides of said first and second flanges so as to provide said safety bar with a closed, generally trapezoidal-shaped cross section;

said second flange, when viewed in cross section, defining a flat central portion and opposite end portions;

said first flange, when viewed in cross section, defining a flat central portion and opposite end portions, said central portion of said first flange being parallel to said flat central portion of said second flange, and said opposite end portions of said first flange being generally semi-circular in shape and extending away from an imaginary plane defined by the flat central portion of said first flange on the side thereof opposite the side facing said second flange;

said second flange, when viewed in cross section, being longer than said first flange, such that said first and second webs diverge from one another as they extend from said first flange to said second flange;

said elongated safety bar being resistant to buckling by forces applied against said semi-circular end portions of said first flange and in the general direction of said second flange.

4,599,844

LARGE BALING PRESS FOR AGRICULTURAL PRODUCTS

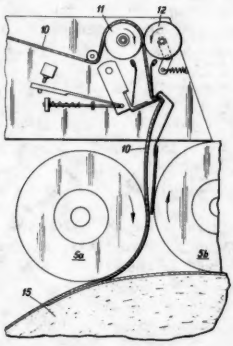
Gerhard Clostermeyer, Gütersloh, and Werner Müller, Harsewinkel, both of Fed. Rep. of Germany, assignors to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Aug. 23, 1984, Ser. No. 644,124

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331671

Int. Cl.⁴ B65B *13/18*

U.S. Cl. 53—118 **7 Claims**



1. A baling press for agricultural products, comprising means forming a pressing chamber of a predetermined width; a plurality of spaced winding rollers limiting said pressing chamber; and means for wrapping a finished product bale including a supply container for a wrapping material, a pair of drawing rollers for drawing the wrapping material, an inlet gap formed by two of said winding rollers rotating in the same direction to introduce the wrapping material into said pressing chamber, said drawing rollers being located above said two winding rollers so that a portion of the wrapping material drawn by said drawing rollers hangs vertically downwardly in direction towards said inlet gap, a separating device for separating a portion of the wrapping material and including a separating cutter movable in the region between said drawing rollers and said two winding rollers along a predetermined path, and two guiding elements located between said drawing rollers and said inlet gap formed by said winding rollers, said guiding elements being spaced from one another and extending the width of said pressing chamber, said guiding elements having different length including a first guiding element which is located closer to said separting cutter and is shorter, and a second guiding element which is located farther from said separating cutter and is longer, said second guiding element having a recess into which said separating cutter is inserted during cutting, said second guiding element also having a guiding projection extending downwardly into said inlet gap so as to allow said portion of the wrapping material to contact only one of said two winding rollers and prevent its contact with the other of said two winding rollers to thereby feed the portion of the wrapping material through said inlet gap into said pressing chamber.

4,599,845

AUTOMATIC DEVICE FOR THE DRAWING OF BUNDLES OF WELDED BAGS OF PLASTIC MATERIAL AND FOR THE INSERTION THEREOF INTO CONTAINER MEANS

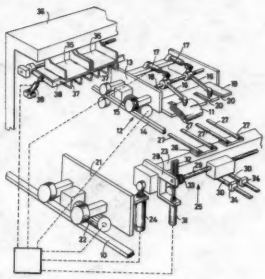
Marco Luoni, Via Leonardo da Vinci 33, Dairago(Milan), Italy

Filed Jun. 17, 1985, Ser. No. 745,509

Claims priority, application Italy, Jun. 20, 1984, 22340/84[U]

Int. Cl.⁴ B65B *35/50*

U.S. Cl. 53—251 **7 Claims**



1. Automatic device for the drawing of bundles of welded bags of plastic material, and the insertion of the same bundles into container means, said device comprising a first carriage provided with gripping means for gripping bundles and movable in a plane parallel to a bundle feeding plane, and a second carriage provided with handling means for carrying bundles and running in a plane parallel to but lower than the running plane of the said first carriage, said carriages both being provided with driving means for movement in said planes, said handling means being mounted to run in a plane perpendicular to said planes in order to draw bundles from said gripping means and to move such bundles into said container means, said handling means having means for surrounding and containing bundles so as to keep bundles well assembled, said gripping means and said handling means each being provided with moving means for movement between an open position and a closed position.

4,599,846

CAPPING HEAD

Darwin L. Ellis, and Frank M. Kelly, both of Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 19, 1984, Ser. No. 602,237

Int. Cl.⁴ B65B *3/20*

U.S. Cl. 53—331.5 **7 Claims**

1. A capping head for rotary application of a cap to a container comprising:

an elongated housing adapted to be secured to a rotationally driven spindle for axial rotation of said housing;

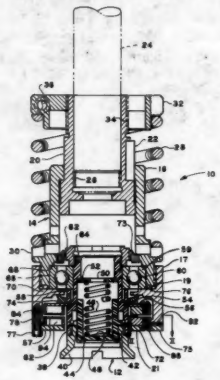
a chuck means rotatably carried by said housing for rotation with respect thereto;

said housing including a selectively removable housing portion which retains said chuck means with respect to said housing and which is removable from the capping head to permit selective release of said chuck means from said housing;

magnetic clutch means including a pair of magnetically cooperable lower and upper rings carried, respectively, by the lower axial end of said housing portion and by said chuck means for rotationally driving said chuck means in response to rotation of said housing;

said lower ring being adjustably secured to said housing portion for adjustment of the axial spacing thereof from said upper ring to thereby permit adjustment of the torque

transmission capacity of said clutch means while said housing portion is maintained in its installed configuration on said caping head; and



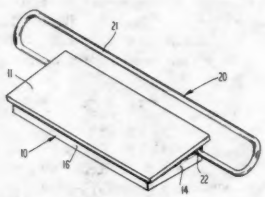
selectively interchangeable spacer means adapted to be installed axially intermediate said housing portion and said lower ring to permit said adjustment of said axial spacing by selectiv interchange of ones of said interchangeable spacer means for others of said spacers means.

4,599,847

THERMAL CUT-OFF DEVICE FOR PACKAGING MACHINE

Arthur L. Reenstra, 105 Old York Rd., New Hope, Pa. 18938

Filed Jan. 31, 1985, Ser. No. 696,807
Int. Cl.[4] B65B *67/08*
U.S. Cl. 53—390 **10 Claims**



1. In wrapping machinery having a supply of heat-sealable plastic film for wrapping articles therein to form a sealed package:

a. a heat-conductor thermal cut-off conductor for severing the film from the film supply;

b. a hot-plate unit for sealing the package, said unit having a top hot plate;

c. a source of electric power for supplying electric current to said hot plate for heating the hot plate to a film-sealing non-burning temperature of the order of 300°–325° F.; and

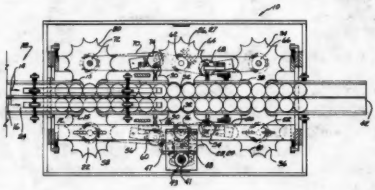
d. combination heat-conductive transfer means and thermal cut-off mounting means, coupling said hot plate in heat-conductive relation to said thermal cut-off conductor solely by said combination means to a film-softening non-burning temperature which is lower than said film-sealing temperature and which is of the order of 260°–285° F., and mounting said thermal cut-off to be carried directly by said hot-plate unit, whereby the heat transfer between the hot plate and the thermal cut-off takes place in a direct conductive path through the mounting means.

4,599,848

MOLDED CLIP REORIENTER AND APPLICATOR

James S. Bader, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Apr. 20, 1984, Ser. No. 602,502
Int. Cl.[4] B65B *27/04, 35/58*
U.S. Cl. 53—398 **17 Claims**



1. A method of aligning a plurality of unattached containers for application of molded clips to form multiple container packages by generating uniform forces between said unattached containers during application of said clips comprising the steps of:

eliminating line pressure on said containers by metering the flow of containers at a first predetermined location;

generating a predetermined forward force on said containers between said first predetermined location and a second predetermined location;

generating a predetermined reverse force on said containers between said second predetermined location and a third predetermined location such that said predetermined forward force and said predetermined reverse force produce a resultant force which is substantially zero at said second predetermined location;

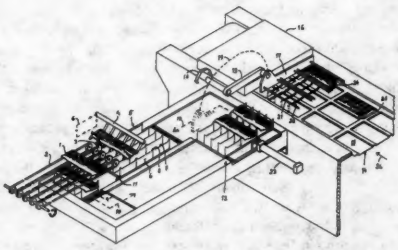
applying said molded clips to said containers at said second predetermined location to ensure uniform expansion and precise alignment of said containers during application of said clips as a result of said substantially uniform forces produced at said second predetermined location.

4,599,849

METHOD AND A MACHINE FOR PACKING SLICED PRODUCTS IN A CONTAINER TO BE VACUUM SEALED

René Lundström, Staffanstorp, Sweden, assignor to Svenska AB Ivers Lee, Lund, Sweden

PCT No. PCT/SE83/00377, § 371 Date Jun. 29, 1984, § 102(e) Date Jun. 29, 1984, PCT Pub. No. WO84/01762, PCT Pub. Date May 10, 1984
PCT Filed Nov. 2, 1983, Ser. No. 624,744
Claims priority, application Sweden, Nov. 2, 1982, 8206224
Int. Cl.[4] B65B *5/10, 25/06*
U.S. Cl. 53—427 **8 Claims**



1. A method of packing sliced products such as bacon bun-

dles in a blister package or similar to be vacuum sealed, characterized in

lifting each bacon bundle by several horizontal, transversally extending tines;

bringing at least one rim portion of the bacon bundle to depend if the length of the bacon bundle exceeds the length of the blister package;

introducing the bacon bundle in the blister package, the depending portion being folded below the remainder of the bundle; and

vacuum sealing the blister package.

4,599,850

METHOD AND APPARATUS FOR DRIVING SEALING ELEMENTS IN A PACKING MACHINE

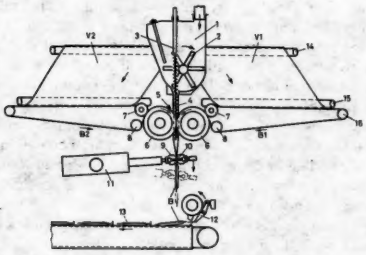
Georg Kopp, Uhwiesen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 30, 1984, Ser. No. 636,014

Claims priority, application Switzerland, Jul. 29, 1983, 4177/83

Int. Cl.⁴ B65B *9/02, 65/04*

U.S. Cl. 53—451 **13 Claims**



1. A method of driving first and second sealing elements of a packing machine for providing, respectively, longitudinal and transverse seams to travelling, superposed wrapper sheets of indeterminate length to sequentially make sealed bags of predetermined length therefrom; said first sealing elements comprising a pair of cooperating sealing rollers for providing the longitudinal seams; said second sealing elements comprising a pair of cooperating sealing shoes movable towards and away from one another to assume a sealing position and an idling position, respectively; comprising the following steps, repeated cyclically for sealing sealing each bag:

(a) rotating undirectionally said sealing rollers in first and second consecutive, intermittent steps for providing said longitudinal seam in two consecutive length portions each corresponding to one-half said determined length;

(b) moving said sealing shoes, while in said sealing position, codirectionally with the travelling direction of the wrapper sheets for the entire period in which one of said first and second steps is performed, whereby said sealing shoes execute a sealing stroke, whose length corresponds to one-half of said predetermined length, to provide a transverse seam on said wrapper sleeve;

(c) moving said sealing shoes, while in said idling position, against said travelling direction for the entire period in which the other of said first and second steps is performed, whereby said sealing shoes execute a return to move into a starting position; and

(d) positively synchronizing steps (b) and (c) with one another.

4,599,851

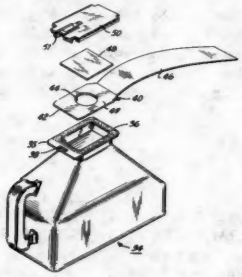
DRY TONER CARTRIDGE SYSTEM AND METHOD OF FILLING SAME

Brian L. Williams, West Hurley, N.Y., assignor to Marpac Industries, Inc., Allendale, N.J.

Filed Oct. 4, 1984, Ser. No. 657,790

Int. Cl.⁴ B65B *7/28, 1/28*

U.S. Cl. 53—471 **8 Claims**



7. An improved method for filling a dry toner cartridge having a toner storage area and toner dispensing opening with a flange portion for receiving means for sealing the toner dispensing opening including removeable tape means, the improved method comprising: cutting an opening of predetermined configuration into the portion of the tape means covering the toner dispensing opening into which the nozzle for filling said container with the dry toner can be placed, said opening of predetermined configuration designed to permit entry of the nozzle to enable filling the container with the toner, said fill port of predetermined configuration further designed to substantially impede the development of toner clouds outside the container during the filling operation by nesting substantially closely about the nozzle; and applying the removeable tape means to the flange portion of said toner dispensing opening, such that said opening of predetermined configuration is positioned over part of the toner dispensing opening.

4,599,852

ADJUSTABLE LEAF SPRING SUSPENSION FOR FLEXIBLE CUTTERBAR

Dathan R. Kerber, Bollingbrook; Orlin W. Johnson, Lockport, and Richard E. Benson, East Moline, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jul. 24, 1985, Ser. No. 758,312

Int. Cl.⁴ A01D *67/00*

U.S. Cl. 56—15.8 **9 Claims**

1. A header attachable to a combine or the like for harvesting a standing crop comprising:

a header frame;

a cutter bar mounted on said frame for vertical movement relative thereto to maintain a close-cutting relation to the ground to cut the standing crop as the header is moved parallel to the ground;

a plurality of spaced leaf springs mounted at their rearward end to said header frame and respectively extending for-

wardly to exert a lifting force on said cutterbar assembly to resiliently support the same for vertical movement relative to said frame, each leaf spring being connected to said cutterbar assembly with a fore-and-aft sliding connection enabling said cutterbar assembly to shift relative to said springs; and

adjustment means associated with each leaf spring adjacent the rearward end thereof having a fulcrum point longitudinally movable beneath said leaf springs for varying the lifting force exerted thereby on said cutterbar assembly,

each of said springs being downwardly bowed over a substantial portion of the forwardly extending length thereof, the rearward end portion of each of said springs curving upwardly in opposed relation to the downwardly bowed portion thereof.

4,599,853

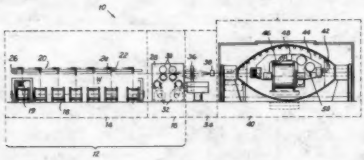
METHOD AND APPARATUS FOR MANUFACTURING COMPACT CONDUCTORS WITH BUNCHERS

Andre Varga-Papp, Ontario, Canada, assignor to Ceeco Machinery Manufacturing Limited, Concord, Canada

Continuation-in-part of Ser. No. 621,485, Jun. 18, 1984, abandoned. This application Jun. 7, 1985, Ser. No. 741,452

Int. Cl.[4] H01B *13/02, 13/26;* D07B *3/10*

U.S. Cl. 57—9 **23 Claims**



1. Apparatus for making twisted compact conductors including a plurality of wires comprising means for providing a plurality of complementary segmented preshaped wires each having a desired cross-sectional profiled configuration in the final compact conductor and each defining at least lateral surfaces; means for positioning and orienting the preshaped wires with relation to each other to substantially correspond to the positions and orientations therebetween in the final twisted compact conductor; twisting means, downstream of said means for positioning and orienting, for imparting at least one twist to the wires; means for feeding the wires to said twisting means at a rate of speed to cause the lateral surfaces of adjacent preshaped wires to substantially abut against each other and to produce the desired lay, whereby interstices between the wires forming the twisted conductor are substantially eliminated to form a compact twisted conductor.

17. A method of making compact conductors comprising the steps of providing and feeding a plurality of complementary segmented preshaped wires each having a desired cross-sectional profiled configuration in the final compact conductor and each defining at least lateral surfaces; positioning and orienting the preshaped wires with relation to each other to substantially correspond to the positions and orientations therebetween in the final twisted compact conductor; imparting at least one twist to the wires after the wires have been positioned and oriented, the feeding of the preshaped wires taking place at the rate of speed to cause the lateral surfaces of adjacent preshaped wires to substantially abut against each other and to produce the desired lay of the product, whereby interstices between the wires forming the twisted conductor are substantially eliminated to form a compact twisted conductor.

4,599,854

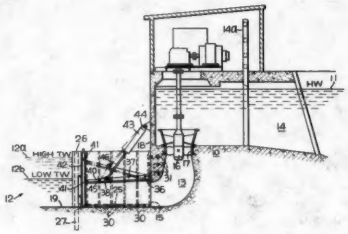
ADJUSTABLE DRAFT TUBE

Howard A. Mayo, Jr., York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 12, 1984, Ser. No. 660,305

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—398 **1 Claim**



1. A hydraulic turbine installation comprising:

a foundation structure separating a high elevation headwater from a lower elevation tailwater with a water level in said tailwater variable between a predetermined high tailwater level and a predetermined low tailwater with said foundation structure presenting a generally vertical wall on the downstream side within said tailwater reservoir and a generally horizontal floor extending away from said wall into said tailwater;

a water passageway formed through said foundation having an inlet in communication with said high elevation reservoir and an outlet in communication with said low elevation tailwater with said passageway being generally rectangular and having a lower surface flush with said floor and said passageway having a roof member and opposing side walls flush with said outlet;

a turbine runner rotatably supported within said passageway intermediate said inlet and outlet;

an adjustable draft tube portion provided on the downstream side of said vertical wall and within said tailwater comprising a pair of vertical side walls each comprising a pier having a generally rectangular cross-section box frame with a plurality of reinforcing ribs secured to interior surfaces of said frame and a floor plate spaced from said tailwater floor to define a plurality of cavities within each pier;

means for securing upstream edges of said sidewalls to said foundation structure with said passageway outlet disposed between said side walls; means for securing said side walls to a floor of said tailwater;

a draft tube roof member comprising a flap having an end pivotally secured to said foundation structure above said outlet with said roof member generally horizontal and pivotal about a generally horizontal axis of rotation; said flap extending between said side walls and pivotal about said axis with a free end of said flap movable between a first position beneath said predetermined low tailwater level and a second position between said predetermined low tailwater level and said predetermined high tailwater level;

a pair of horizontally axially aligned opposing trunnions secured to said frames, a torque tube extending between piers and carried by said trunnions for pivotal movement about a horizontal axis central of said tube, and said flap secured to said tube for pivotal movement therewith; and

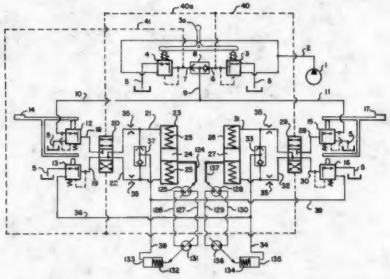
means for pivoting said flapo with said free end moving between said first and second positions.

4,599,855

CONTROLS FOR THE DRIVE OF A VEHICLE WITH DIFFERENTIAL SPEED STEERING

Hans H. Seelman, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 5, 1983, Ser. No. 482,142
Int. Cl.[4] B62D *11/04;* F16D *31/02*
U.S. Cl. 60—421 8 Claims



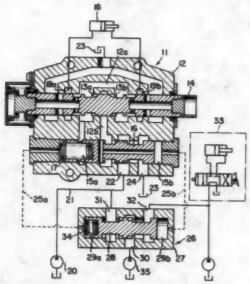
1. In a control for the drive of a vehicle with differential-speed steering and with a hydrostatic drive unit on each side of the vehicle for operating the drive wheels, a final control element at each of the two drive units controlling the operation thereof and each connected with a spring-loaded servo piston capable of sliding in an operating cylinder, the improvements comprising a pressure chamber on each side of the each servo piston in the operating cylinder, means providing an arbitrarily adjustable control pressure on the servo piston, a first pair of control pressure pickoffs for controlling the forward and reverse travel which can be connected with operating cylinders of the drive units of both sides of the vehicle, two additional second pair of control pressure pickoffs, each assigned to one turning direction connected with the operating cylinder of the drive unit of the vehicle side on the inside of the curve, each servo piston being capable of being acted upon by the control pressure pickoff of said first pair of control pressure pickoffs assigned to the control on one side for controlling the direction and speed of travel, and, on the other side, may be acted upon by a control pressure pickoff of the one pair of said second pairs of pickoffs assigned to turning travel for controloing the turning radius, a pilot valve located in the connection line between a control pressure pickoff of said one pair of said second pairs of pickoffs assigned to turning travel and the operating cylinder of the assigned drive unit, an arbitrarily actuable direction and speed selective lever, means for switching said pilot valve as a function of the position of said arbitrarily actuable direction and speed selective lever, said pilot valve connecting the control pressure pickoff assigned to turning travel with a pressure chamber of an operating cylinder of the drive unit on the inside of the curve, the other pressure chamber of which operating cylinder is acted upon by control pressure from the control pressure pickoff of said first pair of pickoffs that determines at least one of the speed and the direction of travel, means for first operating the control pressure pickoff of said one pair of second pairs of pickoffs assigned to one turning direction of the control pressure pickoff pair of said second pairs of pickoffs determining the direction and radius of turning and designed to reduce the control pressure in the chamber of the operating cylinder acted upon by the control pressure pickoff of said first pair of pickoffs that determines the direction and speed of travel in the case of a slight actuation, and then with increased actuation simultaneously operating a control pressure pickoff of said first pair of pickoffs furnishing a control pressure on the ppposite side of the servo piston, and a connection from said control pressure pickoff of said first pair of pickoffs to the pressure supply at the outlet of the control pressure pickoff of said first pair of pickoffs determining the speed of travel.

4,599,856

HYDRAULIC APPARATUS USED FOR OPERATING VEHICLES

Hideo Araki, Tokyo, and Chiharu Matsunaga, Ayase, both of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,148
Claims priority, application Japan, Jul. 8, 1981, 56-106717
Int. Cl.[4] F15B *13/06, 13/09*
U.S. Cl. 60—421 1 Claim



1. A hydraulic apparatus used for a vehicle having a propulsion engine of the type comprising a control valve having a valve body provided with a fluid inlet and containing a plunger, said plunger being provided with a pair of orifices only of which opens on one side exclusively at a time or vice versa in accordance with a shifting direction of said plunger and the degrees of said opening being variable in accordance with a shift amount of said plunger, valve means provided with a pressure compensation spool biased by a spring and operatively connected to said control valve to maintain a constant pressure drop across said variable orifices, at least two pumps driven by said engine for delivering fluid, a steering circuit operatively connected to said control valve, and an implement circuit operatively connected to said first spool to receive returned excess oil therefrom, said fluid inlet of said control valve being connected to a first pump of said pumps, said first spool being provided with an oil inlet connected to a second pump of said pumps and first and second oil outlets connected respectively to said fluid inlet of said control valve and to said implement circuit, and control valve further comprising a second pressure compensating spool biasing by a spring and operatively connected to said plunger through fluid passages to maintain a constant pressure drop across said variable orifices and to return excess oil to an external tank, said second spool being controlled by a pressure difference caused between upstream and downstream portions of said orifices with respect to fluid flow direction from said first pump, said oil inlet of said first spool being cut off from said first oil outlet and connected to said second oil outlet when said pressure difference at said orifices is larger than a pre-determined control pressure of said first spool, said oil inlet of said first spool being connected to said first oil outlet when said pressure difference is lower than said predetermined control pressure of said first spool, and said control pressure being determined to be lower than a pressure predetermined to control said second spool.

4,599,857

METHOD OF POWER GENERATION AND ITS APPARATUS UTILIZING GRAVITATION FORCE AND BUOYANCY

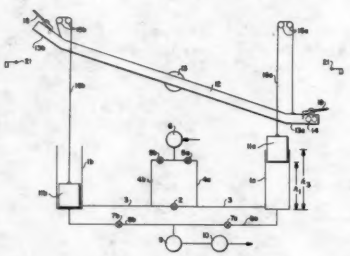
Myung K. Kim, 9018 Dolfield Rd., Owings Mills, Md. 21117, and Se E. Lee, 345-45 Kaebong-dong, Kuro-ku, Seoul, Rep. of Korea

Filed Mar. 21, 1985, Ser. No. 714,542

Claims priority, application Rep. of Korea, Jan. 10, 1985, 95/1985

Int. Cl.[4] F03G *3/00*

U.S. Cl. 60—495 **9 Claims**



1. An apparatus for the generation of power which comprises:

a first cylinder and a second cylinder,

a first float and a second float member disposed in said first and second cylinders, respectively,

a lever arm pivotally disposed above the cylinder, the end portions of said lever arm being operatively connected to said respective float members, said lever arm containing weight members and defining a path for guiding said weight members to traverse said lever arm between said end portions, and

means for alternatively introducing and removing a fluid to and from said first and second cylinders, whereby when the fluid is introduced into said first cylinders and simultaneously removed from the second cylinders, the first float member is caused to rise wherein the first cylinder and the second float member is caused to fall in the second cylinder, causing the lever arm to pivot about its axis which in turn causes to weight members to relocate from one end portion of the lever arm to the other end portion thereof.

4,599,858

OCEAN WAVE ENERGY DEVICE

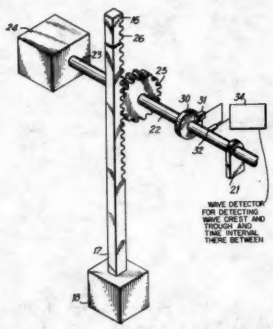
Joseph P. La Stella, R.F.D. #2, Rte. 202, Yorktown Heights, N.Y. 10458, and Michael G. Tornabene, 285 Oak Neck La., West Islip, N.Y. 11795

Filed Oct. 25, 1977, Ser. No. 844,573

Int. Cl.[4] F03B *13/12*

U.S. Cl. 60—497 **6 Claims**

1. In an ocean wave energy device of a type including a buoy which reciprocates in a substantially vertical direction in response to successive waves of variable frequency passing therebeneath, said buoy being supported upon a substantially vertically oriented shaft and a power take off means including a shaft driven by movement of said vertical shaft, the improvement comprising: wave frequency detector means for detecting the instantaneous frequency of a wave passing said detector and which will thereafter pass said buoy by monitoring the contour of each wave as such wave passes such wave frequency detector means and measuring the time interval between the crest and following trough and between the trough and following crest of each such wave and means for imposing an artificial resonance to said buoy whereby said buoy resonance may be substantially conformed to the frequency of the wave at the time at said buoy, said artificial resonance imposing means including brake means for halting vertical movement of said buoy at substantially the uppermost and substantially the lowermost limits of vertical travel of said buoy, means independent of said wave frequency detector means for sensing said uppermost and said lowermost limits and actuating said braking means and means interconnecting said braking means and said wave frequency detector means for releasing said braking means after a selected time interval in accordance



with the pre-measured time interval between the crest and following trough and between the trough and following crest of the wave as such pre-measured time intervals were measured by said wave frequency detector means when said wave passing said buoy was passing said wave frequency detector means to release said buoy to descent under the action of gravity into the trough of said wave to its said lowermost limit of vertical travel and to ascent under the action of the buoyance in such wave through the immediately following wave crest to the said uppermost limit of vertical travel.

4,599,859

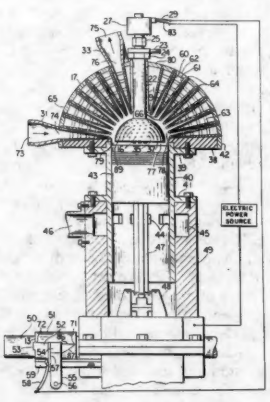
COMBINED STEAM GENERATOR AND ENGINE

Charles L. Urso, 215 Newton St., Waltham, Mass. 02154

Filed Feb. 1, 1985, Ser. No. 697,251

Int. Cl.[4] F01K *11/00, 21/02*

U.S. Cl. 60—514 **17 Claims**



1. A steam generator/engine comprising:

a conduit spirally wound and having an exterior surface

which defines a corrugated surface of a steam generating chamber surrounded by the conduit;

conduit inlet and outlet means for passing heating fluid through the conduit;

sprayer means for spraying noncombustible vaporizable liquid directly at all areas of the corrugated surface to generate steam;

a piston enclosure;

a piston slidably supported within the enclosure to form an expansible chamber, the piston movable between a minimum chamber volume position and a maximum chamber volume position;

means for connecting the steam generating chamber to the expansible chamber wherein the steam generating chamber is in constantly open fluid communication with the expansible chamber so that the piston moves from the minimum volume position to the maximum volume position when compelled by steam pressure to produce a piston power stroke;

means for returning the piston to the minimum volume position;

means for connecting the piston to a power utilizing mechanism for work use;

means for actuating spraying; and

means for adjustably synchronizing the means for actuating spraying such that spraying starts and stops at cyclically timed intervals to sustain operation and to control the power performance of the generator/engine.

4,599,860

LIQUID PRESSURE APPARATUS

David Parsons, Leamington Spa, England, assignor to Automotive Products plc, Warwickshire, England

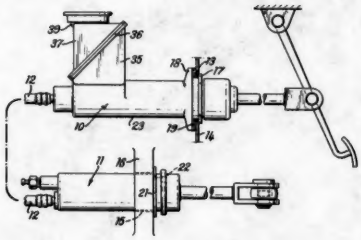
Continuation of Ser. No. 911,477, Jun. 1, 1978, Pat. No. 4,407,125, which is a continuation of Ser. No. 676,474, Apr. 13, 1976, abandoned. This application May 10, 1982, Ser. No. 376,248

Claims priority, application United Kingdom, Apr. 14, 1975, 15283/75

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.[4] B60T *11/30*

U.S. Cl. 60—584 **10 Claims**



1. A method of shipping and installing a pre-assembled hydraulic actuating apparatus comprising a master cylinder having an outlet, a slave cylinder having an inlet, a conduit interconnecting the outlet of said master cylinder to the inlet of said slave cylinder, and a bleed port for controllably placing the interior of said hydraulic apparatus in communication with the ambient, said method comprising opening said bleed port to the ambient, filling said master cylinder, said conduit and said slave cylinder with a hydraulic fluid while simultaneously bleeding atmospheric air therein contained through said bleed port open to the ambient, and closing said bleed port after said apparatus has been fully filled with said hydraulic fluid prior to shipment for installation on a motor vehicle.

4,599,861

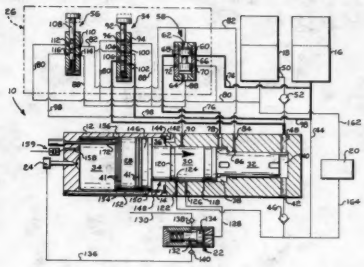
INTERNAL COMBUSTION HYDRAULIC ENGINE

Richard W. Beaumont, 1315 Hickory Ct., Sidney, Ohio 45365

Filed May 13, 1985, Ser. No. 733,074

Int. Cl.[4] F02B *71/04*

U.S. Cl. 60—595 **20 Claims**



1. An internal combustion hydraulic engine comprising:

cylinder means to receive pressurized fuel for combustion thereof at one end and to receive hydraulic fluid for pressurization thereof at a second end;

piston means axially reciprocatable in said cylinder means to pressurize hydraulic fluid, said piston means and said cylinder means cooperating to form a combustion chamber, a scavenger pressure chamber communicatable with said combustion chamber, a piston return chamber and a work chamber;

actuator means to move said piston to an axial start position;

return pressurization means to selectively pressurize said return chamber to force said piston means from said start position toward said first end to pressurize said combustion chamber;

fuel supply means to supply pressurized fuel to said combustion chamber to effect combustion thereof;

hydraulic fluid supply means to supply hydraulic fluid to said work chamber;

pressure release means to selectively release pressure from said return chamber and said work chamber; and

scavenging means to selectively supply pressurized fluid from said scavenger pressure chamber to said combustion chamber to force fuel combustion exhausts from said combustion chamber whereby combustion of pressurized fuel in said combustion chamber drives said piston means to pressurize hydraulic fluid in said work chamber.

4,599,862

TURBOCHARGER FOR TWO-CYCLE ENGINES AND METHOD OF OPERATION THEREOF

Robert M. Bergeron, 27 Ball Ave., North Salem, N.H. 03073

Filed Feb. 5, 1985, Ser. No. 698,601

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—605 **24 Claims**

1. In a turbocharger for a two-cycle engine having an oil mist containing crankcase and burning a mixture of liquid fuel containing lubricating oil therein wherein the turbocharger comprises a shaft mounted in a housing for rotation by an exhaust-driven turbine on one end to drive a compressor on the other end connected to supply pressurized air for the fuel/air mixture of the engine, the improvement to supply lubrication to the shaft and automatically enrichen the fuel/air mixture during high speed turbocharging compising:

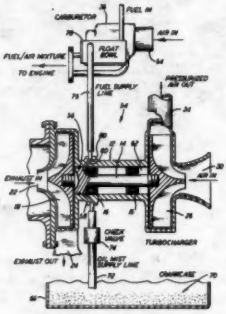
(a) a pair of ball bearings supporting the shaft within the housing adjacent respective ends of the shaft;

(b) sealing means disposed between the exhaust-driven turbine and the adjacent one of said bearings for blocking the passage of exhaust gasses into said housing;

(c) a first conduit in the housing communicating between an intake portion of the air pressurizing turbine and the adjacent one of said bearings;

(d) second and third conduits in the housing communicating from outside the housing to a point inside the housing between said sealing means and said one of said bearings adjacent thereto;

(e) a fourth conduit connected between the crankcase and said second conduit; and,



(f) a fifth conduit connected between said third conduit and a source of the liquid fuel at a pressure directly related to the rpm's of the engine, whereby the oil mist is drawn out of the crankcase, through said bearings, and out of said first conduit to provide lubrication at low engine rpm's and, additionally, at high engine rpm's , fuel containing lubricating oil passes through said bearings and out said first conduit to join the pressurized air being created by the air pressurizing turbine to provide additional lubrication and cooling of said bearings while simultaneously enriching the air/fuel mixture.

4,599,863

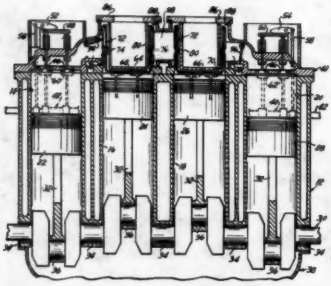
COMPOUND INTERNAL COMBUSTION AND EXTERNAL COMBUSTION ENGINE

Andrew R. Marttila, 19565 Northbrook Dr., Southfield, Mich. 48076

Continuation of Ser. No. 195,845, Oct. 10, 1980, abandoned. This application Jan. 27, 1983, Ser. No. 461,650

Int. Cl.[4] F02G *5/02*

U.S. Cl. 60—616 **11 Claims**



1. A compound engine comprising at least one internal combustion cylinder having an inlet and an outlet and one external combustion cylinder having an inlet and an outlet, each of said cylinders having a reciprocable piston therein coupled to a common utilization output shaft, heat exchanger means associated with said external combustion cylinder for transferring heat to a space in said cylinder above said piston in said external combustion cylinder, means for transferring hot exhaust gases exhausted from said internal combustion cylinder during its exhaust cycle to said heat exchanger means, means for introducing a heat expandable gas through the inlet of said external combustion cylinder into said space above said piston in said external combustion cylinder whereby heat transferred by said heat exchanger means to said space during passage of said exhaust gases through said heat exchanger means causes cooling of said exhaust gases and expansion of said heat expandable gas in said space imparting motive power to said piston in said external combustion cylinder and to said common utilization output shaft in addition to motive power applied to said shaft by said piston in said internal combustion cylinder during conventional expansion cycles in said internal combustion cylinder, means for exhausting said heat expandable gas after expansion in said combustion cylinder to the inlet of said internal combustion cylinder, and means for exhausting said cooled exhaust gases to the ambient, wherein said expandable gas after expansion is exhausted to said inlet of said internal combustion engine cylinder during a return stroke of the piston associated with said external combustion cylinder effectuated simultaneously with a downstroke of the piston associated with said internal combustion cylinder, and wherein said heat exchanger means comprises an annular chamber disposed above and in communication with said external combustion cylinder, whereby a portion of said expandable gas is displaced into said annular chamber during upstroke of the piston associated with said external combustion cylinder in the course of a compression cycle in said external combustion cylinder.

4,599,864

GAS ENGINE WITH GAS SUPPLY DEVICE

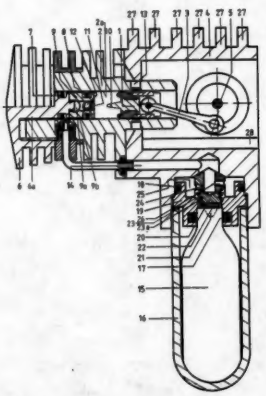
Peter Neukomm, Wettingham, Switzerland, assignor to Pewa Technic AG, Dietikon, Switzerland

Filed Jan. 15, 1985, Ser. No. 691,699

Claims priority, application Switzerland, Jan. 25, 1984, 315/84

Int. Cl.[4] F01K *25/00*

U.S. Cl. 60—671 **7 Claims**



1. A gas engine having a gas supply device, comprising:

an intermediate housing;

at least one sleeve mounted at said intermediate housing;

at least one pressurized gas container for containing partially liquid gas and accommodated within said at least one sleeve and mounted at said intermediate housing by means of said at least one sleeve;

at least one gas engine mounted at said intermediate housing;

a gas supply conduit leading from said at least one pressurized

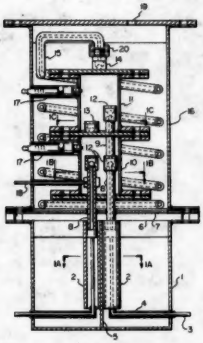
gas container to said at least one gas engine and having a predetermined extent;
a gas superheater conduit means arranged within said extent of said gas supply conduit;
said intermediate housing comprising a material having a relatively high specific heat;
said intermediate housing having a substantially bell-shaped configuration with at least one open end;
said substantially bell-shaped intermediate housing having an internal surface and an external surface and being provided with fins on at least one of said internal surface and said external surface;
said at least one sleeve having good thermal conduction properties;
said at least one sleeve being in thermal communication with said at least one pressurized gas container;
said at least one gas engine having an expansion chamber;
a thermally conductive cylinder surrounding at least said expansion chamber of said at least one gas engine; and
said intermediate housing, said gas superheater conduit means, said at least one sleeve and said thermally conductive cylinder being in mutual thermal communication.

4,599,865

PROCESS FOR GENERATING STEAM FOR POWER GENERATION BY UTILIZING HYDROGEN AND OXYGEN OBTAINED BY ELECTROLYSIS OF WATER

Rajendra P. Dalal, 17/73, Netaji Subhash Rd., Bombay 400 020, India

Filed Jan. 22, 1985, Ser. No. 693,338
Claims priority, application India, Oct. 19, 1984, 289/BOM/84
Int. Cl.[4] F01K *21/00*
U.S. Cl. 60—673 **10 Claims**



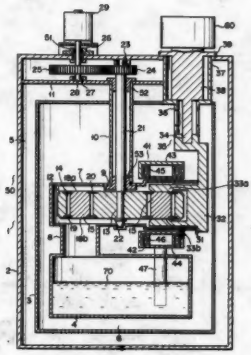
1. A method of combustion of hydrogen to produce heat, which method comprises the steps of (1) electrolysing water, (2) passing the hydrogen products and a fraction of the oxygen products of this electrolysis immediately to a first combustion zone for combustion there of this fraction of oxygen products and a fraction of the hydrogen products, (3) after combustion immediately passing the products from this first combustion zone and the remaining fraction of the oxygen products from the electrolysis to a second combustion zone for combustion, and (4) applying the heat produced to a desired use.

4,599,866

MAGNETIC REFRIGERATOR

Hideki Nakagome, Yokohama, and Satoshi Yasuda, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 30, 1985, Ser. No. 739,277
Claims priority, application Japan, Jun. 5, 1984, 59-114901
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **12 Claims**



1. A magnetic refrigerator comprising:
a magnetic field generator adapted to normally generate a magnetic field;
at least one working substance which generates heat when it is within the magnetic field and absorbs the heat, when it is outside the magnetic field, to cause a gas to be condensed;
drive means for relatively moving the working substance and magnetic field generator to permit the working substance to alternately enter and leave the magnetic field; and
a heat elimination system adapted to permit the generated heat to be dissipated into the outside from the working substance, when the working substance enters the magnetic field,
the improvement in which
said working substance has a pair of opposite, flat surfaces and a grooved, outer peripheral surface where the gas is deposited to permit condensation, and
said heat elimination system includes a heat conductor which, when the working substance enters the magnetic field, contacts both the flat surfaces of the working substance to permit the generated heat to be taken from the working substance and, when it is outside the magnetic field, is not in contact with the flat surfaces of the working substance.

4,599,867

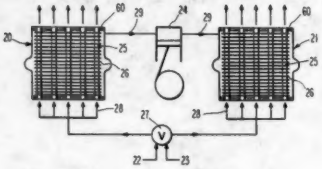
HYDROGEN STORAGE CELL

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

Filed Jan. 25, 1985, Ser. No. 695,073
Int. Cl.[4] F17C *11/00*
U.S. Cl. 62—48 **15 Claims**

1. A hydrogen storage cell comprising:
(a) a plurality of metal fins,
(b) the fins being coated with a metal capable of forming a metal hydride,
(c) the fins being attached to a plurality of sealed metal heat pipes, at least some of the heat pipes having a volatile liquid inside the heat pipe,
(d) the heat pipes being disposed within a vessel, and extend-

ing beyond the length of the vessel, the two ends of the vessel being defined by a pair of tube sheets, the tube



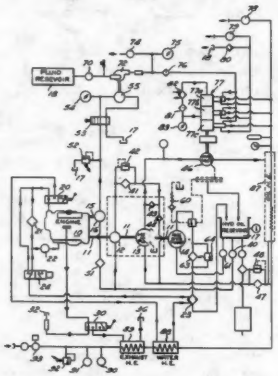
sheets being supported, by the portions of the heat pipes located within the vessel, against pressure within the vessel.

4,599,868

VAPORIZATION SYSTEM

Robert D. Lutjens, Hacienda Heights, and Robert A. Zarate, Ontario, both of Calif., assignors to Cryomec, Incorporated, Anaheim, Calif.

Filed Nov. 5, 1984, Ser. No. 668,516
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—53 **15 Claims**



1. A system for transferring heat from a first fluid to a second fluid, said first and second fluids having a high temperature differential, comprising:

means for pumping said first fluid at a first flow rate through a fluid circuit, said first flow rate being variable;

means for pumping said second fluid at a second flow rate through a second fluid circuit, said second flow rate being variable; and

a heat exchanger located in both said first and second circuits such that heat in said first fluid is transferred to said second fluid, in order to reduce said high temperature differential to a lower temperature differential; and

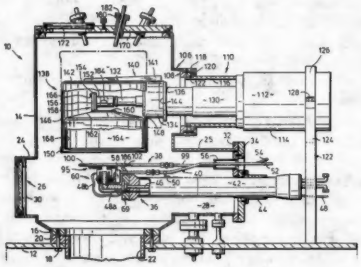
means for regulating said first and second flow rates such that said first flow rate is directly proportional to said second flow rate and such that variations in said first flow rate produce a proportional variation in said second flow rate whereby said lower temperature differential is maintained thus avoiding excessive temperatures in said first fluid or said second fluid.

4,599,869

CRYOGENIC DEPOSITION OF CATALYSTS

Geoffrey A. Ozin, 63 Gormley Ave., Toronto, Ontario, Canada M4V 1Y9, and Karl Molnar, 3 Woodglen Way, Unionville, Ontario, Canada L3R 3A8

Filed Mar. 12, 1984, Ser. No. 588,616
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **42 Claims**



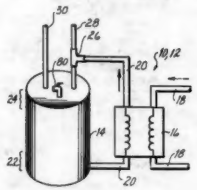
1. A reactor comprising a housing, means to permit within evacuation of said housing, means within said housing to locate a material, vaporising means to vaporise said material, collection means positioned above said location means to collect vaporised material on a surface thereof directed toward said location means, support means to support said collection means within said housing and heat extraction means to extract heat from said collection means and maintain said surface at a predetermined temperature, said support means permitting movement of said collection means from a first position in which said surface is directed toward said location means to a second position in which said surface is directed away from said location means whereby material deposited on said surface is supported in a stable manner when said surface is in said second position.

4,599,870

THERMOSYPHON HEAT RECOVERY

Theodore M. Hebert, 10225 Hyaleah, Tampa, Fla. 33617, and Thomas H. Hebert, 14915 Nebraska, Tampa, Fla. 33612

Continuation-in-part of Ser. No. 247,247, Mar. 25, 1981, Pat. No. 4,373,346. This application Jan. 7, 1983, Ser. No. 456,202
Int. Cl.[4] F25B *27/02*
U.S. Cl. 62—238.6 **3 Claims**



1. A thermosyphonic heat recovery unit for thermosyphonic heat transfer of heat from a hotter first fluid to a cooler second fluid, comprising in combination:

a heat exchanger including a first fluid conduit and a second fluid conduit connected in a heat exchanging relationship with one another;

means for connecting a pressurized source of the hotter first fluid in fluid communication with said first conduit enabling the hotter first fluid to flow through said first conduit;

means for connecting said second conduit in fluid communication with a non-pressurized source of the cooler second fluid;

said source of the second fluid comprising a tank in which the second fluid is stored;

the input and the output of said second conduit being connected in fluid communication with the lower and the upper regions, respectively, of said tank; and

said tank including a pressurized cold fluid input and hot fluid output and further comprising a mixing valve interconnected in fluid communication between said cold fluid input and said hot fluid output;

whereby the second fluid thermosyphonically flows through said second conduit as the first fluid flows through said first conduit.

4,599,871

STORAGE PLANT

Benny Fredrixon, Hersbyvägen 58, Lidingö, S-181 42, Sweden

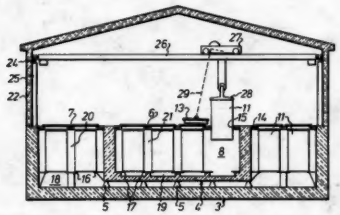
PCT No. PCT/SE84/00247, § 371 Date Feb. 13, 1985, § 102(e) Date Feb. 13, 1985, PCT Pub. No. WO85/00422, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 28, 1984, Ser. No. 711,510

Claims priority, application Sweden, Jan. 7, 1983, 8303794

Int. Cl.[4] F25D *25/00*

U.S. Cl. 62—378 **9 Claims**



1. A plant for storage of goods intended to be stored at different temperature levels, especially frozen storage and cold storage levels, including storage compartment means adapted for vertical insertion and removal of pre-loaded container, and handling apparatus for effecting said insertion and removal, characterized in that a sub-structure of said plant includes first storage compartment means for storing goods at a first temperature substantially different from ambient temperature and second storage compartment means surrounding said first storage compartment means for storing goods at a second temperature less different than said first temperature from the ambient temperature and for providing a climatic barrier about said first storage compartment means, in that bottom means of said first storage compartment means is thermally insulated from a bottom of said sub-structure, and in that said sub-substructure is constructed to be disposed within a surrounding medium having a temperature which remains substantially constant year-round.

4,599,872

POUR THROUGH BEVERAGE CHILLER

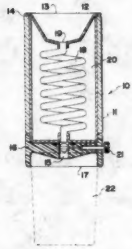
Wesley G. Rist, 36 River Road, Winnipeg, Manitoba, Canada R2M 3Z2

Continuation-in-part of Ser. No. 679,404, Dec. 7, 1984, abandoned. This application Oct. 10, 1985, Ser. No. 786,043

Int. Cl.[4] B67D *5/62*

U.S. Cl. 62—399 **20 Claims**

1. A beverage cooling device comprising in combination an insulated container, a beverage receiving portion at the upper end of said container in sealed relationship therewith, a discharge at the base of said container in sealed relationship therewith and at least one conduit extending between said beverage receiving portion, downwardly through said container to said discharge and in sealing relationship therewith, a relatively low freezing point material in said container surrounding said conduit and being permanently sealed within said contained, said container including a perimetrical wall extending downwardly below said discharge, the diameter of said wall being at least substantially equal to the diameter of said casing and being selectively engageable around the upper end of a receiving container, the lower side of said perimetrical wall being perpendicular to the vertical axis of said device for supporting same on a planar horizontal surface, said discharge including a downwardly extended cone-shaped portion to facilitate engagement of said device with the associated receiving container, said discharge extending through said cone-shaped portion and terminating above the lower side of said perimetrical wall.



4,599,873

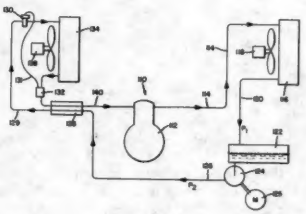
APPARATUS FOR MAXIMIZING REFRIGERATION CAPACITY

Robert E. Hyde, 2229 SE. 170th, Portland, Oreg. 97233

Filed Jan. 31, 1984, Ser. No. 575,693

Int. Cl.[4] F25B *1/00*

U.S. Cl. 62—498 **3 Claims**



1. A compression type refrigeration system, comprising:

an evaporator, a compressor, a condenser, a refrigerant receiver and conduit means interconnecting the same in a single closed loop for circulating refrigerant therethrough, the conduit means including

a first conduit for circulating a flow of refrigerant from the receiver to the evaporator and

a second conduit for circulating a return flow of refrigerant gas from the evaporator to the receiver solely through the compressor and the condenser for condensation by the condenser at a first pressure directly related to the head pressure at the compressor;

a variable flow expansion valve in the first conduit adjacent the evaporator for expanding the flow of refrigerant into the evaporator;

a centrifugal pump in the first conduit adjacent the receiver, the pump being adapted continuously during operation of the compressor to increase the pressure of the condensed refrigerant in the first conduit by a generally constant

increment of pressure of at least five pounds per square inch to provide the refrigerant with a second pressure greater than the first pressure by the amount of said increment, the second pressure being sufficient to suppress flash gas and feed a completely condensed liquid refrigerant to the expansion valve, the first conduit circulating the refrigerant solely through the pump;

motor means for the pump; and

a magnetic pump drive connecting the motor means to the pump to drive the same,

whereby the pressure and the temperature of the refrigerant at the outlet of the condenser can be permitted to vary solely in response to ambient conditions at the condenser, and the pressure at the outlet of the condenser is substantially equal to the vapor pressure of the refrigerant.

4,599,874

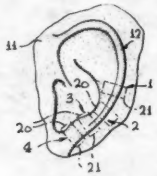
DECORATIVE EAR CUFF

Kathryn A. Gullickson, 6121 White Oak Ave., Reseda, Calif. 91335

Continuation-in-part of Ser. No. 566,317, Dec. 28, 1983, abandoned. This application Nov. 28, 1984, Ser. No. 675,742

Int. Cl.[4] A44C *7/00*

U.S. Cl. 63—14 R **9 Claims**



1. A decorative ear cuff for releasable attachment to the inner and outer ridges of an ear of a wearer comprising

a thin, flat, one-piece elongated strip of metal formed into a flat main body portion and an upper arcutate clip and a lower arcuate clip, said clips forming means adapted to cooperate with each other for fitting the cuff to an individual ear and for comfortable attachment of the cuff onto the inner and outer ridges of the ear of the wearer without deformation of the flesh of the ear,

said upper clip being permanently prepositioned with respect to said main body portion and said lower clip being manually deformable relative to said main body portion whereby it may be adjusted by the wearer to a position suited to the wearer's ear.

4,599,875

GATE LOCK STRUCTURE

William De Forrest, 1825 Via Burton, Anaheim, Calif. 92806

Filed Aug. 9, 1984, Ser. No. 639,011

Int. Cl.[4] E05B *65/08*

U.S. Cl. 70—95 **8 Claims**

1. A locking device for connecting a first structure to a second structure which comprises:

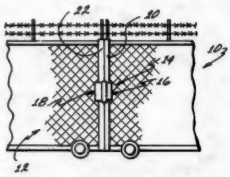
a lock body receptacle, said receptacle having at least first and second opposing faces, said lock body receptacle having a hollow interior, said interior separating said first and said second faces;

mounting means for attaching said lock body receptacle to said first structure;

said first face including a first face opening, said hollow interior of said lock body receptacle sized and shaped so as to contain a padlock type lock body with the keyway of said padlock type lock body exposed through said first face opening allowing manipulation of a key in said keyway, said second face including at least one second face opening, said second face openings sized and shaped and positioned on said first face so as to align with one of a first and second shank opening located on said padlock type lock body when said padlock type lock body is located within the interior of said lock body receptacle;

means located on said lock body receptacle for inserting said padlock type lock body into the interior of said lock body receptacle;

a shank support member, said shank support member including at least a first lock shank located thereon, said lock shank sized and shaped and located on said shank receptacle in a position so as to fit through said second face opening and into said shank opening located on said padlock type lock body which is aligned with said second face opening when said padlock type lock body is located within the interior of said lock body receptacle, said lock shank further including means located thereon for coupling with said padlock typed lock body to lock said shank support member to said lock body receptacle;



means for attaching said shank support member to said second structure, said means for attaching said shank support member to said second structure includes a second lock body receptacle, said second lock body receptacle essentially identical to said first lock body receptacle and including a second padlock type lock body;

said shank support member including a central element, at least a first right side lock shank located on said central element and positioned on said central element to extend to the right side of said central element, at least a first left side lock shank located on said central element and positioned on said central element to extend to the left side of said central element, said right side shank and said left side shank positioned with respect to one another such that said right side shank is capable of passing into said first face opening on said lock body receptacle and said left side shank is capable of passing into said first face opening on said second lock body receptacle.

4,599,876

CONTROL MECHANISMS SUITABLE FOR ACTUATING POWER-OPERATED LOCKS

Ronald W. Johnson, Essex, England, assignor to Dover Corporation, New York, N.Y.

Filed Aug. 19, 1983, Ser. No. 524,836

Claims priority, application United Kingdom, Aug. 19, 1982, 8223884

Int. Cl.[4] E05B *35/00, 19/08*

U.S. Cl. 70—344 **5 Claims**

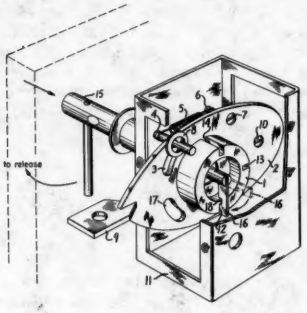
1. A control mechanism for actuating the release member of

an elevator installation of the type having a landing door and a power-operated lock with a release member, for manually opening the door, said control mechanism comprising:

a hollow spindle member, having a central axis and opposite ends, to provide a key-receiving tunnel;

a cylindrical member having a hollow interior communicating with said tunnel and mounted for rotation about said axis, the hollow cylindrical member having an inner cylindrical surface and a distal end having at least one key-engageable surface;

actuating means moveable, responsive to rotation of said hollow cylindrical member, between a rest position and an operative position, wherein said actuating means includes



a beam member attached to said hollow cylindrical member for rotation therewith; and

a key member sized for insertion through said hollow spindle member and hollow cylindrical member, said key member having a rotatable end portion with means to engage said key-engageable surface, wherein said end portion is rotatable between an axially aligned position, for insertion through said hollow spindle member and said hollow cylindrical member, and a second position, generally perpendicular to said axis, into engagement with said key-engageable surface, wherein one end of said hollow spindle member is disposed within said inner, cylindrical surface of said hollow cylindrical member.

4,599,877

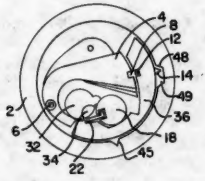
KEY LOCK WITH KEY ISOLATION

Jacob Rabinow, 6920 Selkirk Dr., Bethesda, Md. 20817

Filed Nov. 8, 1985, Ser. No. 796,070

Int. Cl.[4] E05B *29/02*

U.S. Cl. 70—366 **23 Claims**



1. In a lock and key combination,

locking means comprising first and second members movable with respect to each other in order to unlock the lock,

a plurality of movable devices which if set in predetermined positions, respectively, permit the lock to be opened,

a key for setting said devices in said predetermined positions respectively,

said lock having key receiving means to permit entry of only a portion of said key, whereby a portion of the key projects out of the lock,

blocking means for blocking movement of said members relative to each other when said movable devices are not in said predetermined positions, and which does not block relative movement of said members when said movable devices are in said predetermined positions respectively, said last-named means allowing the correctness of the settings of the movable devices to be tested by attempting to move one of said members a sufficient distance relative to the other to see if said last-named means is blocking the movement of one said members relative to the other one,

whereby said key may operate said lock to perform a normal lock-opening operation, and

movable means, operable during the normal lock-opening operation, for moving into the path of, and for blocking the passage of, any lock-picking tool that may enter said key receiving means, and before such tool can advance to said devices.

4,599,878

BENDING AND STRAIGHTENING APPARATUS

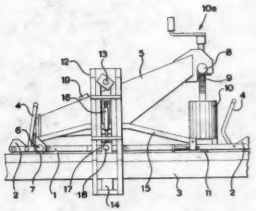
Michael J. Hudson, West Bridgford, and John C. Sinclair, Willington, both of United Kingdom, assignors to The Permanent Way Equipment Company Limited, United Kingdom

Filed Apr. 18, 1984, Ser. No. 601,498

Claims priority, application United Kingdom, Apr. 23, 1983, 8311095; Apr. 23, 1983, 8311111

Int. Cl.[4] B21B *37/08*

U.S. Cl. 72—19 **11 Claims**



1. A method of bending a rail forming part of a railway line to a predeterined deformation from a datum, said rail being capable of both elastic and plastic deformation, comprising:

(a) applying a load to said rail with a loading means, said loading means being at least one of three rail-engaging members, said three rail-engaging members comprising spaced first and second rail-engaging members and a third rail-engaging member therebetween and coupled by a beam, and, while said load is applied, measuring said load applied between said beam and said rail with a load measuring means; and measuring the displacement of said rail at said third rail-engaging member relative to the positions of said first and second rail-engaging members and relative to said datum,

(b) establishing from said measurements a load at which said plastic component of the total deformation measured is equal to said predetermined deformation from the datum, and then removing said load.

5. Apparatus for bending a rail forming part of a railway line to a predetermined deformation from a datum, said rail being capable of both elastic and plastic deformation, comprising:

(a) a beam having spaced first and second rail-engaging members and a third rail-engaging member therebetween coupled thereto;

(b) loading means in force transmitting relation between said beam and at least one of said rail-engaging members for applying a load between said beam and said rail;

(c) load-measuring means mounted on said beam for generat-

ing a signal representing said load applied to said beam and said rail by said loading means;

(d) displacement-measuring means mounted at said third rail-engaging member and coupled to said first and second rail engaging members for generating a signal representing said displacement of said rail at said third rail-engaging member relative to the positions of said first and second rail-engaging members and relative to said datum;

(e) sampling means electrically connected to said load-measuring-and displacement-measuring means for periodically sampling said signals generated by said measuring means;

(f) processing means electrically connected to said sampling means

(i) detecting from samples supplied by said sampling means those samples which are obtained below the elastic limit for said rail,

(ii) deriving therefrom a linear function relating said load to displacement under said elastic deformation,

(iii) calculating for each subsequent sample using said function a predicted value of the displacement for said measured load; and

(iv) generating a control signal when the difference between said measured displacement in a subsequent sample and said predicted value for said measured load in said sample is substantially equal to the predetermined deformation, and

(g) control means electrically connected to said processing means responsive to said control signal to terminate the operation of said loading means.

4,599,879

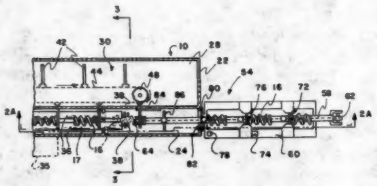
CONVEYOR SYSTEM FOR A SHOT PEENING MACHINE

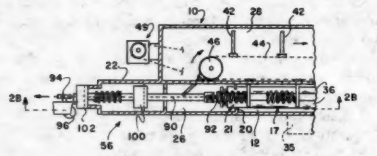
Gerold Lienert, Georgetown, Canada, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 690,011, Jan. 9, 1985, abandoned, which is a continuation of Ser. No. 445,395, Nov. 30, 1982, abandoned. This application Aug. 26, 1985, Ser. No. 769,112

Int. Cl.[4] B23P *9/04*

U.S. Cl. 72—53 **3 Claims**





1. A conveyor system for a shot peening machine of the type which includes blast wheel means or the like which is capable of propelling a plurality of shot generally downwardly into a critical blast region in a blast cabinet for shot peening a plurality of work pieces passing therethrough, comprising:

first and second openings through longitudinally spaced end walls of said blast cabinet,

workpiece support means extending longitudinally through said first and second openings and said blast cabinet,

a vertical wall extending between said longitudinally spaced end walls of said blast cabinet,

continuous conveying means located exterior of said blast cabinet on one side of said vertical wall,

narrow access means substantially in the form of a horizontal slot extending the length of said vertical wall from said first opening to said second opening; and

a plurality of finger elements supportd by said continuous conveying means, each said finger element being spaced from adjacent finger elements and extending horiontally from said continuous conveying means in line with said narrow access means and above said support means whereby said finger elements are each adapted to extend through said narrow access means to contact and convey one of said work pieces along said support means through said first opening, said blast cabinet and said second opening and to return to said first opening with said continuous conveying means along a looped path of travel outside of said blast cabinet.

4,599,880

METHOD OF MAKING METAL FIBERS AND APPARATUS FOR EFFECTING SAME

Alexandr V. Stepanenko; Leonid A. Isaevich, and Ljudmila I. Moisinovich, all of Minsk, U.S.S.R., assignors to Belorussky Politekhnichesky Institut, Minsk, U.S.S.R.

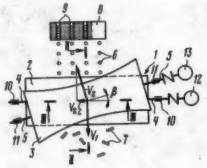
PCT No. PCT/SU83/00001, § 371 Date Nov. 10, 1983, § 102(e) Date Nov. 10, 1983, PCT Pub. No. WO83/03375, PCT Pub. Date Oct. 13, 1983

PCT Filed Jan. 25, 1983, Ser. No. 557,156

Claims priority, application U.S.S.R., Dec. 23, 1981, 3362752; Mar. 25, 1982, 3403801; Oct. 20, 1982, 3499001; Dec. 3, 1982, 3514152

Int. Cl.[4] B21H *1/18*

U.S. Cl. 72—94 **14 Claims**



1. A method of making metal fibers from spherical particles of a metal powder, comprising the steps of:

feeding said spherical particles of metal powder;

deforming said spherical particles by rolling over each of said spherical particles so that said spherical particles roll along a rolling axis thereof, while moving in a direction perpendicular to the rolling axis;

stretching each said particle being deformed along said rolling axis thereof, which coincides with the longitudinal axis of said metal fiber being formed, by contact friction forces;

simultaneously performing said stretching in said deforming step;

carrying out said stretching at a rate exceeding the rate of elongation of each said particle being deformed that would be achieved by a decrease in the diameter of said particle as a result of said rolling over alone; and

unloading said metal fibers.

4,599,881

METHOD AND ARRANGEMENT FOR WINDING AND FORMING HELIXES OF ELASTIC PLASTIC OR METAL WIRE

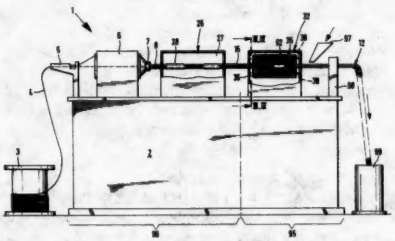
Wolfgang Bachmann, Dreieich; Dieter Spahn, Hanau, and Lothar Nuss, Offenbach, all of Fed. Rep. of Germany, assignors to Roda Holding Anstalt, Vaduz, Liechtenstein

Filed Apr. 20, 1984, Ser. No. 602,413

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315417

Int. Cl.[4] B21F *3/04, 45/00*

U.S. Cl. 72—128 54 Claims



1. A method of winding and forming of helixes of elastic synthetic plastic or metal wire with windings having substantially straight winding legs and head curves connecting the latter, the method comprising the steps of supplying a wire from supply means; winding the wire so as to form a plurality of windings with head curves lying tight against one another and with parallel straight winding legs; separating the windings without their deformation and providing selected distances therebetween; transporting the windings by exerting a force on the windings only in the region of the head curves; and flattening and widening only the separated straight winding legs located at least at one side of the windings without flattening and widening of the head curves, by deforming only the separated straight winding legs located at least at one side of the windings.

4,599,882

DEVICE FOR BENDING THE MARGINS OF A METAL FOIL OVER THE EDGE OF A FLAT GLASS ARTICLE

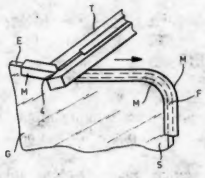
Heinz Herrmann, Leipziger Str. 105, D-4154 Tönisvorst 1, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,542

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 8336280[U]

Int. Cl.[4] B21D *17/10*

U.S. Cl. 72—211 11 Claims



1. A device for bending the margins of a foil strip adhesively secured to an edge of a flat glass article onto broad surfaces of said article adjacent said edge, said device comprising a handle and a pair of parallel flanks extending from said handle and adapted to straddle said edge, said flanks being positioned to press said margins against said surface, said flanks having inwardly projecting shoulders lying intermediate said flanks forming guide surfaces for riding on said edge, said guide surfaces extending the entire height of said flanks and inclined to a longitudinal dimension of said flanks.

4,599,883

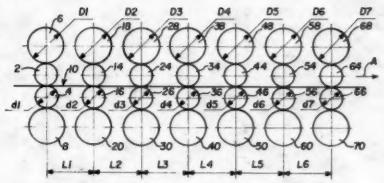
TANDEM ROLLING MILL

Vladimir B. Ginzburg, Pittsburgh, and Remn M. Guo, Monroeville, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Jul. 5, 1985, Ser. No. 752,021

Int. Cl.[4] B21B *1/24, 29/00*

U.S. Cl. 72—234 15 Claims



1. A tandem rolling mill comprising

a plurality of mill stands each having a pair of work rolls and a pair of associated backup rolls, and

a downstream roll stand having work rolls of reduced diameter and backup rolls of increased diameter with respect to the diameters of the work rolls and backup rolls of an upstream stand.

13. A tandem rolling mill comprising

a plurality of mill stands each having a pair of work rolls and a pair of associated backup rolls, and

a downstream roll stand having work rolls of reduced diameter and increased length with respect to the diameters and lengths of work rolls of an upstream stand.

4,599,884

APPARATUS FOR TRANSFERRING RELATIVELY FLAT OBJECTS

Henry C. Bachmann; Omar L. Brown; Ermal C. Fraze, all of Dayton; James R. Gregg, Springboro, and David K. Wynn, Dayton, all of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Filed Jan. 16, 1984, Ser. No. 571,051

Int. Cl.[4] B21D *45/00*

U.S. Cl. 72—346 4 Claims

1. Apparatus for transferring a relatively flat object from a first station to a second station, comprising:

means within the first station for supporting the object at the first station;

means located adjacent the first station for striking a blow edgewise of the object to direct the object edgewise to the second station along a predetermined path;

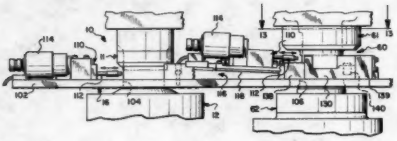
a pair of fingers disposed in a spaced relationship at the second station to define between said fingers a portion of said path for an object, said path portion so defined being of a width slightly greater than the object along the entire length of the path;

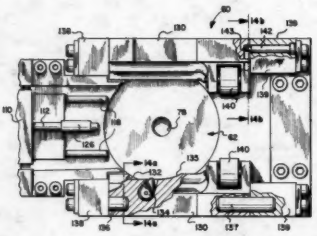
each of said fingers having a flange extending inwardly therefrom at substantially the top thereof so as to extend at least partially over said path portion;

each of said fingers further defining a path wall having an end surface extending generally into said object path at a location along said finger remote from the point of entry of an object between said fingers, each said end surface extending inwardly sufficiently to block a portion of said object path for halting movement of the object; and

a spring pawl carried within each of said fingers, extending partially into said object path and constructed to permit movement of the object therepast without halting the object

for entering the pathway, but to prevent movement of the object therepast in the reverse direction, said pawls being





positioned along said fingers for preventing rebounding of the object from said end surfaces.

4,599,885

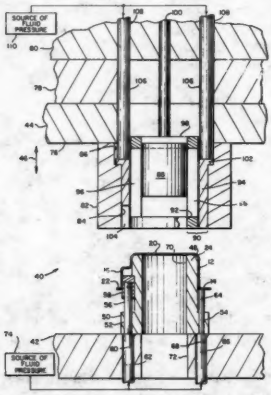
COLD DRAWING A DISK INTO A CAP FOR A PAPER CORE

Harris E. Stone, 293 Lenox St., Norwood, Mass. 02062

Division of Ser. No. 241,394, Mar. 6, 1981, Pat. No. 4,407,428. This application Mar. 28, 1983, Ser. No. 479,255

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—347 **3 Claims**



1. Apparatus for forming a cap from a cylindrical cup for a paper core having a notch in an end of said core, comprising:

(a) a press having a fixed portion and a movable portion, said fixed portion including a clamping member;

(b) a cylindrical member shaped so as to receive said cylindrical cup and mounted on said fixed portion, said cylindrical member formed with an axial hole;

(c) a ram and a plurality of opposed cylinders carried by said movable portion and concentric with said cylindrical member of said fixed portion; said ram designed to be axially displaced within said hole;

(d) said plurality of opposed cylinders including an outer cylindrical member fixedly secured to said movable portion, an annular sleeve mounted for axial displacement within said outer cylindrical member, and an annular ring disposed about said ram and within said annular sleeve for free axial movement within said annular sleeve;

(e) means for moving said movable portion toward said fixed portion;

(f) said annular sleeve being displaceable relative to and away from said fixed portion when said movable portion is advanced toward said fixed portion;

(g) a source of fluid pressure bearing on said annular sleeve in a direction toward said fixed portion;

(h) whereby said outer cylindrical member and said annular sleeve are designed to surround said cylindrical cup disposed on said cylindrical member, with a rim of said cylindrical cup being clamped between said clamping member and said annular sleeve.

4,599,886

MANUFACTURE OF METAL CONTAINERS

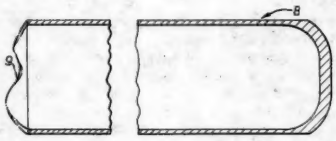
Eric D. Brown, Northants, England, assignor to Sodastream Limited, Peterborough, England

Filed Oct. 10, 1984, Ser. No. 659,305

Claims priority, application United Kingdom, Oct. 10, 1983, 8327016

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—349 **10 Claims**



1. A method of making a container which comprises the steps of (1) providing a metal blank made of high strength steel, said metal blank having a peripheral edge with surface irregularities, (2) removing a surface layer from the peripheral edge of said metal blank so as to remove said surface irregularities, and (3) deep drawing and ironing said metal blank obtained in step (2) to form a cup-shape.

4,599,887

APPARATUS FOR CONTROLLING DYNAMIC CHARACTERISTICS OF PRESS LOAD

Akio Asai; Yukito Ando, and Kazunari Kirii, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 23, 1985, Ser. No. 758,125

Int. Cl.[4] B21J *9/18*

U.S. Cl. 72—453.13 **6 Claims**

1. An apparatus, for controlling dynamic characteristics of a press load, comprising:

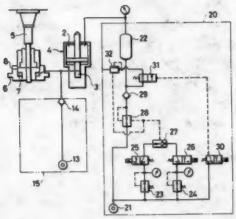
a hydraulic device means which supplies hydraulic pressure to oil chambers in a protector cylinder and a hydroblank holder; and

a pneumatic device means which includes a pneumatic source and an accumulator and supplies a pneumatic pressure balancing said hydraulic pressure to said hydroblank holder, said pneumatic device mean including:

(a) first and second pneumatic pressure supply means provided in parallel, and said first pneumatic pressure supply means being adapted to set a standard pneumatic pressure with which predetermined dynamic load characteristics can be obtained in said accumulator, said second pneumatic pressure supply means being adapted to set a pneu-

matic pressure higher or lower than said standard pneumatic pressure in said accumulator;

(b) depressurizing means being adapted to depressurize said accumulator to the pneumatic pressure set by said first and second pneumatic pressure supply means; and



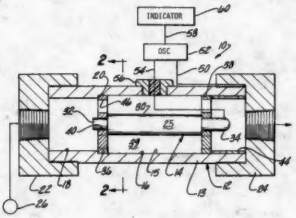
(c) control means, being adapted to actuate said two pneumatic pressure supply means and said depressurizing means in accordance with a predetermined press stroke at a predetermined timing.

4,599,888

AIR BUBBLE DETECTOR DEVICE

Arthur Hufton, Mobile, Ala., and David Gardner, Halse, United Kingdom, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 7, 1983, Ser. No. 558,979
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **4 Claims**



1. A device for detecting the presence of air in a fluid system containing a dielectric fluid, comprising:

a capacitor comprising a first electrical plate comprising a tube, a second electrical plate comprising a rod, and means for coaxially mounting said rod in said tube, said plates being spaced apart from each other and defining a continuous cylindrical chamber therebetween;

means for fluidly connecting said chamber to said fluid system; and

means for determining the capacitance of said capacitor, comprising an oscillator, said oscillator including said capacitor as an element so that a variation of the capacitance of said capacitor varies the frequency of said oscillator,

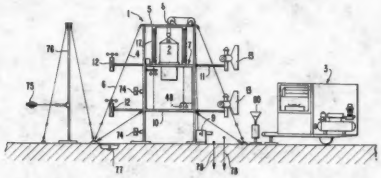
wherein said mounting means comprises a pair of discs, each disc constructed of an electrically insulating material and having an axial hole and a further hole spaced from said axial hole, said discs being positioned within said tube so that an outer periphery of each disc engages an inner periphery of said tube at axially spaced positions and said rod being positioned in said discs' axial holes.

4,599,889

APPARATUS FOR MEASURING THE REAL EVAPOTRANSPIRATION OF A PLANT COVER, FOR MEASURING THE AMOUNT OF CARBON DIOXIDE EXCHANGED BETWEEN SAID PLANT COVER AND THE ATMOSPHERE AND FOR MEASURING THE HYDROUS STATE OF THE GROUND AROUND THE PLANT COVER

Christian Pateras Pescara de Castelluccio, Pau, France, assignor to S.A.R.L. Dite Industrielle Francaise de Mecanique Flambeau, Bizanos, France

Filed Oct. 20, 1982, Ser. No. 435,471
Claims priority, application France, Oct. 20, 1981, 81 19998
Int. Cl.[4] G01N *25/62*
U.S. Cl. 73—23 **14 Claims**



1. An apparatus for measuring the real evapotranspiration of a plant cover, comprising at least one thermodifferential terminal for measuring air temperature above said plant cover, wherein each of said at least one thermodifferential terminals comprises:

(a) articulation means for articulating said at least one thermodifferential terminal around a vertical axis;

(b) orientation means for orienting said at least one thermodifferential terminal relative to the eye of the wind;

(c) a protective outside envelope for reflecting solar radiation from said at least one thermodifferential terminal;

(d) at least one ventilation means for ventilating said thermodifferential terminal, said at least one ventilation means comprising an air entry pipe for admitting air into said at least one thermodifferential terminal, located in the front section of said envelope, and spaced from said envelope by spacing means;

(e) thermal insulation means for thermally insulating said air entry pipe; and

(f) at least one means for recording the air temperature measured by said thermodifferential terminal, wherein each of said at least one thermodifferential terminals is equipped with two protective horizontal and coaxial disks of different diameters for protecting said means for recording the temperature from solar radiation, said disks being located one above the other and above said means for recording the temperature, and held apart from each other by a set of struts connected to a horizontal platform for support.

4,599,890

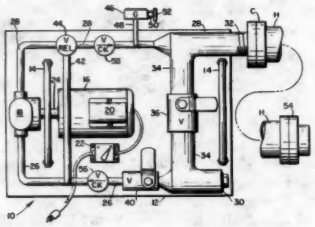
HYDROSTATIC TEST APPARATUS

Joseph M. Girone, Bon Air, and F. Wesley Dolezal, Chesterfield, both of Va., assignors to Process Engineering Incorporated, Richmond, Va.

Filed Sep. 5, 1984, Ser. No. 647,521
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—37 **7 Claims**

1. Hydrostatic test apparatus for pressure testing a vessel such as a length of hose or the like, said test apparatus comprising: means including a first fluid conduit means for so connecting a vessel being tested for leaks to a source of hydraulic fluid that said vessel can be filled with hydraulic fluid at the pressure available at said fluid source, said first conduit means having an inlet and an outlet to which said source of fluid and the vessel being tested are respectively adapted to be connected; means

for increasing the pressure on the hydraulic fluid in said vessel after it has been filled with said hydraulic fluid as aforesaid, said means for increasing the pressure on said hydraulic fluid including a second fluid conduit means connected in parallel with said first conduit means and a motor driven pump in said second fluid conduit means for increasing the pressure on hydraulic fluid flowing through said second conduit means, said pump being the only pumping means in said apparatus; first and second manually adjustable valve means in said first fluid conduit means which can be opened to effect a flow of the hydraulic fluid through the first conduit means and fill the vessel being tested and then respectively closed and opened to divert all of the hydraulic fluid through the second conduit means and, with said pump running, increase the pressure on the hydraulic fluid in the vessel as aforesaid; means for limiting the pressure exerted on said hydraulic fluid to a selected level, said last-mentioned means comprising a third conduit means



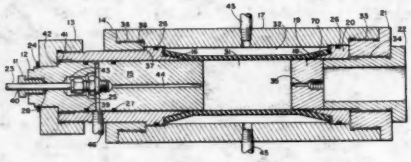
connected in parallel with the second conduit means and across the inlet and outlet of said pump and a pressure responsive valve means for diverting hydraulic fluid from said second conduit means on the outlet side of the pump through said third conduit means to said second conduit means on the inlet side of the pump as necessary to keep the pressure on the hydraulic fluid in the vessel being tested from exceeding the selected level, said valve being adjustable to alter the pressure at which fluid is diverted through said third conduit means and, therefore, the pressure to which the fluid in the vessel being tested can be raised; and check valve means in said second conduit means on the downstream side of said pressure responsive valve means for maintaining the pressure on the hydraulic liquid in the vessel being tested at the selected level in the absence of leaks in said vessel by preventing a backflow of the hydraulic fluid through the second and third conduit means.

4,599,891

TCH—TRI-AXIAL CORE HOLDER

Paul R. Brauer, Tulsa; Thomas J. Barnickel, and Gary C. Mast, both of Broken Arrow, all of Okla., assignors to Temco, Inc., Tulsa, Okla.

Filed Jun. 7, 1984, Ser. No. 618,039
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **6 Claims**



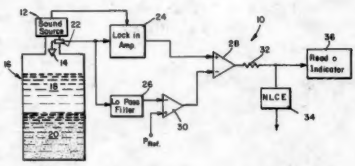
1. A tri-axial core holder comprising:
a hollow housing;
a resilient sleeve within said housing;
first means closing one end of said sleeve;
second means closing the other end of such sleeve and movable therein;
first pressure means for applying radial pressure on said sleeve;
second pressure means for applying pressure on said second means in a direction of the longitudinal axis of said sleeve independently of the radial pressure on said sleeve;
fluid passages through said first and second means including concentric tubings so that fluid can be inserted through the smaller of such concentric tubings and returned through the annulus between the tubings, two different fluids can be inserted simultaneously or pressure can be monitored at the face of the core when inserted.

4,599,892

VOLUME MEASURING APPARATUS

Navin H. Doshi, 6418 Springpark Ave., Los Angeles, Calif. 90056

Filed Dec. 4, 1984, Ser. No. 677,880
Int. Cl.[4] G01F *17/00*
U.S. Cl. 73—49.2 **26 Claims**



1. An apparatus for measuring the volume of an incompressible material in an enclosed space, comprising:
a fluid;
means for containing said fluid and the material to be measured, said means being substantially sealed in order to prevent the escape of the material and the fluid therefrom;
means for emitting sound into said fluid thereby inducing dynamic fluid pressure change in the fluid;
means for measuring the dynamic pressure change in the fluid caused by said means for emitting sound;
means for measuring a static pressure change in the fluid;
first means for comparing the measurement of the static fluid pressure change to a desired reference pressure measurement, said first means communicatingly connected to the means for measuring the static fluid pressure change and to the desired reference pressure measurement;
second means for comparing the measurement of the dynamic fluid pressure change to the comparison of the static fluid pressure change to the desired reference pressure, said second means communicatingly connected to said first means for comparing and to said means for measuring the dynamic fluid pressure;
means for linearizing the relationship between the dynamic fluid pressure change and the volume of the material;
and means for converting the linear relationship between the fluid pressure and the volume into an indication of the volume of the substantially incompressible material in said means for containing the material to be measured.

4,599,893

DETERMINING THE LEVEL OF CONTAMINANTS IN A HYDRAULIC SYSTEM

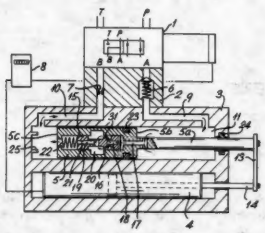
Martin J. Fisher, Milton Keynes; Roger A. Heron, Stagsden, and Martin L. Hughes, Newport Pagnell, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 9, 1984, Ser. No. 598,435

Claims priority, application United Kingdom, Apr. 18, 1983, 8310460; Jan. 31, 1984, 8402434

Int. Cl.[4] G01N *15/06*

U.S. Cl. 73—61 R 10 Claims



1. A device to determine the level of particulate contamination within a hydraulic system comprising:

an orifice, adapted in use to have access to a predetermined volume of the hydraulic fluid of said system;

a piston having a starting position, and arranged in use for free movement from that position and associated with said orifice as that blockage of said orifice by contaminants prevents futher said movement of said piston;

a sub-piston mounted for movement within said piston, said orifice being defined between said sub-piston and said piston, so that blockage of said orifice by contaminants will prevent further movement of said piston;

means to subject said piston in use to a predetermined force and so cause said movement and expel said fluid from said predetermined volume;

means to record within each period of use the distance through which said piston moves from said starting position until further movement is prevented as aforesaid, and

means responsive to a said recordal to clear said orifice and return said piston to said starting position.

4,599,894

METHOD AND APPARATUS TO SHIELD AN AIR FLOW RATE METER DISPOSED IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE FROM AIR COLUMN FLUCTUATIONS

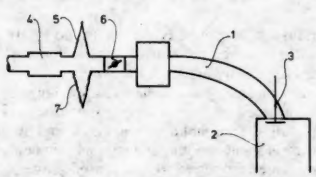
Hans P. Lenz, Vienna, Austria, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,067

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 3417051

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118 15 Claims



1. A method for shielding an air flow rate meter operating with a temperature-dependent resistor disposed in a section within an intake tube of an internal combustion engine from air column fluctuations arising due to non-uniform aspiration action of the engine, comprising the steps of positioning an elastic diaphragm means in a section in said intake tube downstream of said flow rate meter and sealing said elastic diaphragm means to form a chamber which provides a virtually constant pressure.

4,599,895

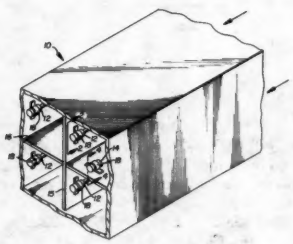
METHOD AND APPARATUS FOR MEASURING FLUID FLOW

Donald F. Wiseman, 24 Lindabury Ave., Bernardsville, N.J. 07924

Filed Jul. 12, 1984, Ser. No. 630,373

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 13 Claims



1. An apparatus for the measurement of airflow through a conduit comprising:

at least one thermally sensitive electrical resistor serving as a measuring resistor located within said conduit and exposed to the flow of air therethrough, the resistance value of said measuring resistor being a function of airflow in said conduit;

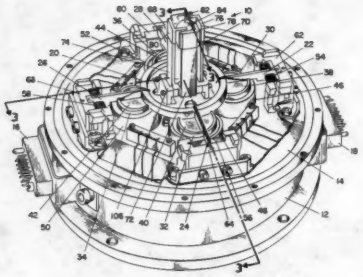
a housing enclosing a thermally sensitive electrical resistor serving as a reference resistor, the volume of said housing being at least fifty times the volume of said reference resistor, the volume and material construction of said housing being sufficient to permit the circulation of air therein by convection to thereby facilitate the exchange of heat between said housing and air ambient to said housing during operating temperatures of said reference resistor so that the enclosed air temperature of said housing is substantially equal to air temperature ambient to said housing; and

electrical circuit means for determining the resistance values of said measuring resistor and said reference resistor and for producing a temperature and airflow compensated voltage output based on said resistance values, said output being representative of airflow through said conduit.

4,599,896
HIGH ACCURACY ACCELEROMETER

Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Feb. 22, 1983, Ser. No. 468,343
Int. Cl.[4] G01P *15/13;* G01V *7/00*
U.S. Cl. 73—382 R 15 Claims

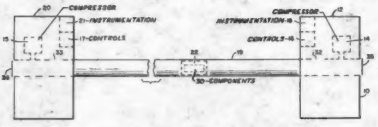


1. Apparatus comprising, in combination:
(a) a pendulous mass including a proofmass;
(b) means for varying the center of gravity of said proofmass as said apparatus is accelerated; and
(c) means for measuring the torque of said proofmass.

4,599,897
TUBULAR SHAPED SLED TEST COMPLEX

Joe S. Hunter, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1985, Ser. No. 718,033
Int. Cl.[4] G01M *19/00, 9/00*
U.S. Cl. 73—432 R 4 Claims

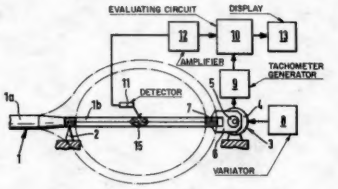


1. A sled test facility for testing components comprising:
a. a blockhouse;
b. a tubular shaped track having a first end communicating into said blockhouse;
c. a recovery station disposed at the second end of said tubular track;
d. a carrier in said tubular track, said carrier having said test components therein;
e. said blockhouse and said recovery station each carrying a compressor, said compressors disposed for creating pressure differentials across said carrier for moving said carrier at a desired rate; and,
f. instrumentation means carried in said blockhouse and in said recovery station.

4,599,898
METHOD AND APPARATUS FOR TESTING BALL STRIKING RACKETS

Walter Beer, Märkiweg 22, CH-5200 Brugg, Switzerland

Filed Oct. 2, 1984, Ser. No. 657,008
Claims priority, application Switzerland, Oct. 12, 1983, 5545/83
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—579 9 Claims

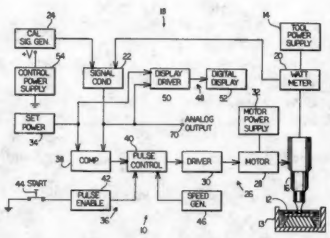


1. A method of ascertaining at least one of several characteristics of a ball striking implement of the type having a netting consisting of strings and a frame for the netting, particularly a tennis racket and component parts thereof, such characteristics including the elastic behavior of the implement, the elasticity of the strings and the damping action, characteristic frequency and tension of the netting, comprising the steps of attaching a mass to a selected part of the implement to be tested; imparting to the selected part and to the mass a vibratory movement at a selected frequency for a selected interval of time, such movement having a plurality of parameters denoting said characteristics; and monitoring during said interval that parameter of the vibratory movement of the mass and of the selected part of the implement which is indicative of the one characteristic thereof.

4,599,899
APPARATUS AND METHOD FOR CONTROLLING A SONIC DEVICE

John P. Jero, Washington; Michael A. Loda, Hanover Park, and William L. Slusarek, Eureka, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 14, 1985, Ser. No. 701,836
Int. Cl.[4] G08B *21/00;* G10K *11/00*
U.S. Cl. 73—584 7 Claims



1. Apparatus for controllably delivering power from a device to a workpiece, comprising:
power means for supplying electrical power;
sonic generator means for controllably supplying sonic power to said workpiece in response to said power supply means;
means for sensing the amount of power consumed by said sonic generator means and producing an actual power signal having a magnitude responsive to said sensed power;
motor means for controllably moving said sonic generator means relative to said workpiece in response to receiving motor control signals;

settable means for producing a desired power signal having a controlled magnitude; and,

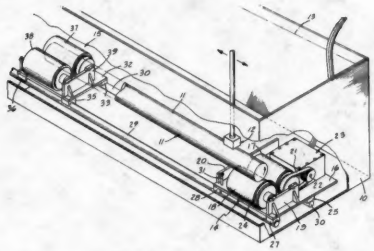
control means for comparing the magnitudes of said desired power and said actual power signals, delivering motor control signals to said motor means in response to the magnitudes of said compared power signals during a predetermined tracking time period, and blocking the delivery of said motor control signals to said motor means in response to termination of said tracking time period.

4,599,900

WORKPIECE FOR HANDLING APPARATUS FOR NONDESTRUCTIVE TESTING

Gary Friedman, Reseda, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Jan. 3, 1984, Ser. No. 567,566
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—622 **5 Claims**



1. In apparatus for nondestructive testing of an elongated workpiece by moving a vibrating surface in spaced relation to the workpiece parallel to its longitudinal axis while the vibrating surface and workpiece are immersed in a tank containing a supply of a sound wave conducting fluid, the improvement comprising;

a first pair of workpiece support rollers mounted in the tank and located to receive and end portion of the workpiece resulting thereon;

a second pair of rollers located in the tank to receive another end portion of the workpiece resting thereon; and

incremental rotative power means mounted within the tank and interconnected with one of said first pair of rollers to incrementally rotate the interconnected roller and the workpiece for successively moving an adjacent workpiece peripheral surface area into opposed relation to the vibrating surface until the entire workpiece peripheral surface has been scanned by the vibrating surface.

4,599,901

PRESSURE-SENSITIVE OPTRODE

Tomas B. Hirschfeld, Livermore, Calif., assignor to University of California, Berkeley, Calif.

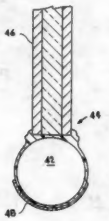
Continuation-in-part of Ser. No. 430,578, Sep. 30, 1982, Pat. No. 4,509,370. This application Nov. 28, 1984, Ser. No. 675,633
Int. Cl.[4] G01L *7/08*
U.S. Cl. 73—705 **23 Claims**

1. An apparatus for monitoring changes in pressure of an associated fluid and for generating optical signals related to said changes in pressure, the apparatus comprising:

(a) a fiber optic through which an illumination beam from at least one associated light source is transmitted from a first end of the fiber optic to a second end of the fiber optic, the second end of the fiber optic having an end face and a conical region of maximal sensitivity, and the conical region having an apex;

(b) a fluorescent composition positioned adjacent to the second end of the fiber optic so that the illumination beam emanating from the second end of the fiber optic impinges on the fluorescent composition causing it to generate fluorescent light; and

(c) resilient means operationally associated with the second end of the fiber optic and the associated fluid whose pressure is to be monitored, the resilient means causing the fluorescent composition to move normally to the end face of the second end of the the fiber optic in response to



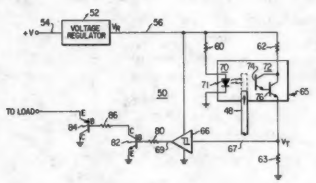
changes in pressure of the associated fluid so that the fiber optic collects and transmits to its first end an amount of fluorescent light related to the pressure of the associated fluid, and the resilient means causing the fluorescent composition to substantially pass through the conical region of maximal sensitivity adjacent to the apex of the conical region in response to changes in pressure of the associated fluid.

4,599,902

CONDITION RESPONSIVE APPARATUS

Tommy L. Gray, Dallas, Tex., assignor to Span Instruments, Inc., Plano, Tex.

Filed Oct. 1, 1984, Ser. No. 656,490
Int. Cl.[4] G01L *7/04*
U.S. Cl. 73—705 **16 Claims**



16. A condition responsive apparatus, comprising:

a pressure gauge having a Bourdon tube expandable in response to an external pressure and including an indicator responsive to the expansion of the Bourdon tube;

an optical coupler including a light emitting diode and a Darlington amplifier detector, said Darlington amplifier detector including an input photo transistor and an output driver transistor;

a vane attached to said Bourdon tube for movement therewith between said light emitting diode and said photo transistor from a first position to a second position in response to a change in external pressure;

a Schmitt trigger circuit having an input connected to a voltage node for receiving a drive voltage and in response thereto generating a control signal, said voltage node being further connected to the output driver transistor;

a coupling circuit connected to the output driver transistor of said Darlington amplifier detector and in response to movement of said vane from the first position to the second position generating the drive voltage above a threshold level to said Schmitt trigger circuit, said Schmitt

trigger circuit generating the control signal in response to the drive voltage above the threshold level;

control means connected to said Schmitt trigger circuit and in response to the control signal generating an output signal; and

power means connected to said control means for applying the output signal to a load.

4,599,903

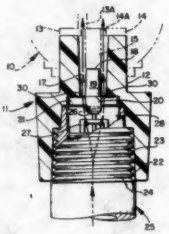
AIR CONDITIONER REFRIGERANT CHECK GUIDE

James E. Ferris, 15 High Mesa Place, Richardson, Tex. 75080

Filed Jun. 3, 1985, Ser. No. 740,478

Int. Cl.[4] G01L *17/00, 19/00*

U.S. Cl. 73—756 **13 Claims**



1. A refrigerant system pressure check gauge adapter comprising: an adapter mold formed of semi rigid yet resiliently flexible plastic having a bottom tube receivable in the valve head opening of a pressure gauge; internal shoulder means within said bottom tube limiting the extent of insertion of a gauge valve pin into said bottom tube; an opening in the top portion of the adapter shaped to fit on and over the low pressure suction side valve fitting of a refrigerant system; projection means within the adapter top portion opening positioned to engage the valve stem of the refrigeration system suction side valve fitting so that as the pressure gauge is pushed toward the refrigerant valve fitting received in said adapter top portion opening the refrigeration system valve is opened and refrigeration material gases pass from the refrigeration system through internal opening passages through the adapter to the pressure gauge to provide a refrigerant gas charge pressure reading for the refrigerant system.

4,599,904

METHOD FOR DETERMINING BOREHOLE STRESS FROM MWD PARAMETER AND CALIPER MEASUREMENTS

John E. Fontenot, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Oct. 2, 1984, Ser. No. 657,029

Int. Cl.[4] G01N *33/24*

U.S. Cl. 73—783 **17 Claims**

1. A method for determining stress at the borehole boundary at a selected location within a borehole, comprising:

measuring while drilling at said location a first parameter including the penetration rate or the torque-on-bit of a drill string under conditions from which the rock strength properties of the formation at said location are determinable from said first parameter;

measuring while drilling at said location a second parameter including a sonic log or the drilling vibrations of said drill string under conditions from which the elastic modulus of said formation at said location is determinable from said second parameter;

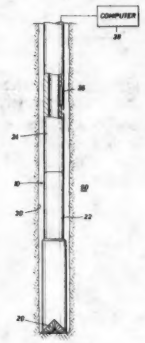
calipering said borehole at said location;

determining said rock strength properties for said formation at said location from said first parameter;

determining said elastic modulus for said formation at said location from said second parameter;

determining Poisson's ratio for said formation at said location;

determining the deformation of said borehole at said location from said calipering; and



determining the stress at said borehole boundary at said location from said rock strength properties, said elastic modulus, said Poisson's ratio and said deformation of said borehole at said location.

4,599,905

METHOD AND APPARATUS FOR DETERMINING THE ELONGATION PROPERTY OF COPPER WIRE

Ralph A. Vogel, Three Rivers, Mich., and Keith E. Caudill, Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jul. 29, 1985, Ser. No. 760,231

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—830 **6 Claims**

1. The method of determining the eventual elongation property of a copper wire which has been cold drawn with an intermediate anneal and which is to be subsequently subjected to a final in-line continuous anneal at a selected elevated temperature for a selected time interval comprising the following steps in sequence:

obtaining a representative length of said copper wire which has been cold drawn with an intermediate anneal but which has not been subjected to a further final anneal;

securing said wire length in taut condition at two longitudinally spaced points thereof by mounting said wire length at its ends to respective first and second wire holding means which are movable relative one to another;

while maintaining said wire length mounted in taut condition to said wire holding means, applying an electric voltage for a period of short duration at said two spaced points to cause a heating current flow through said wire length between said two spaced points, the magnitude and the duration of such heating current flow being such as to effect a predetermined heat treatment of said wire length which approximately simulates that which would be the result of said final in-line continuous anneal;

thereafter moving one of said wire holding means relative to the other and thereby subjecting said wire length to an

increasing tensile force between said two spaced points to elongate said wire length unitl it breaks, and

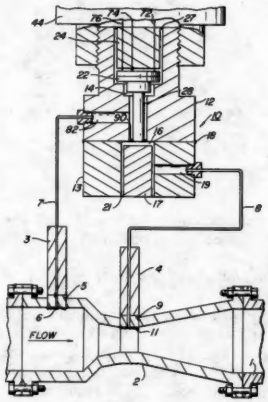
measuring the amount of the elongation of said wire length at the instant of breaking to ascertain the eventual elongation property of said copper wire which would be attained after said final in-line continuous anneal.

4,599,906

REMOTE PROBE DIFFERENTIAL PRESSURE TRANSDUCER

Paul J. Freud, Furlong, and Paul M. Kroninger, Jr., Harleysville, both of Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Oct. 31, 1984, Ser. No. 666,843
Int. Cl.[4] G01F *1/385;* G01L *9/12*
U.S. Cl. 73—861.47 **8 Claims**



3. A differential pressure transducer assembly for measuring low range pressure differentials with a minimum shift of zero under changing temperature conditions where the measurement is to be made across a restriction in a pipe carrying a flowing fluid which contains solids, is dirty or highly viscous comprising:

first and second probes each of which has an insertable end designed for insertion into said pipe at different points as required to detect a differential pressure therebetween, said insertion ends of said probes each having

a cavity of substantially the same volume containing a fill fluid, and

identical barrier diaphragms of minimum but equal thickness mounted at that end of the cavities to be inserted into said flowing fluid for isolating the flowing fluid in the pipe from the fill fluid;

two substantially identical capillary tubes containing fill fluid and connected to the respective cavities of said probes;

a pressure receiving body having first and second pressure receiving sections each having a cavity containing fill fluid, said cavities each being connected by way of said fill fluid to the fill fluid in the cavity of one of said probes by way of the fill fluid in said capillary tubes, said body cavities each being filled by an insert which fits its cavity to close tolerance so as to minimize the volume of fill fluid in said cavities, said inserts being of a material which has a thermal coefficient of expansion which is lower than that of said body and said inserts also being of a volume such that the volumes of fill fluid in said body cavities is substantially equal and such that a change in volume of the fill fluid in each of the body cavities due to temperature changes of the body and the inserts is substantially equal to the change in volume of the fill fluid for such a temperature change without a change in fill fluid pressure; and

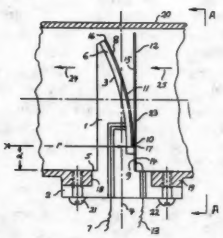
a differential pressure measuring transducer having a diaphragm sandwiched and bonded between two support plates to form on opposite sides of said diaphragm cavities of minimum and substantially equal volumes containing fill fluid, said transducer being placed so that opposite diaphragm cavities communicate through a minimum volume of fill fluid with corresponding body cavities so that said diaphragm will deflect in response to the differences in pressure exerted by the flowing fluid on the barrier diaphragms.

4,599,907

MASS-FLOW SENSING TRANSDUCER

Robert A. Kraus, and Edmund J. Kraus, both of 1636-T Edinger, Santa Ana, Calif. 92705

Filed Apr. 19, 1985, Ser. No. 725,136
Int. Cl.[4] G01F *1/28;* H01G *5/20*
U.S. Cl. 73—861.74 **7 Claims**



1. A variable capacitance device responsive to the impingement of a stream of gas on its flexible sensing element, used for measuring the mass-flow of air expressed in pounds per unit time, comprising:

(a) a rigid capacitor plate having a narrow, cylindrical surface provided with a dielectric material of a well defined thickness, and being provided with means for connecting a terminal lead to its electrically conductive base material;

(b) a flexible capacitor plate having straight, elongated inner and outer surfaces, and being provided with means for connecting a terminal lead to its electrically conductive base material;

(c) a structure for supporting said rigid, and said flexible capacitor plates, having mounting means for being fixed to an air conveying duct; wherein,

said flexible capacitor plate being fixedly arranged to extend longitudinally along said rigid capacitor plate, so that said inner surface of said flexible capacitor plate barely touches one end of said curved surface of said dielectric material, where said rigid and said flexible capacitor plates are generally disposed parallel to one another, and wherein said surface of said dielectric material is curving substantially away from said inner surface of said flexible capacitor plate; and wherein,

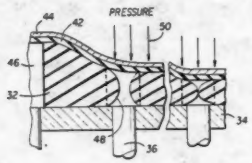
in operation, the the impingement of said stream of air on said outer surface of said flexible capacitor plate causes the gradual bending of, said flexible capacitor plate over said curved surface of said dielectric material, thereby, in turn, causing an increase in the abutting area between said rigid and said flexible capacitor plate, which is accompanied by a corresponding change in capacitance.

4,599,908

OPTO-MECHANICAL TOUCH SENSOR

Thomas B. Sheridan, 32 Sewall St., West Newton, Mass. 02165, and John L. Schneiter, 1 Lisa La., North Reading, Mass. 01864

Filed Mar. 18, 1985, Ser. No. 712,651
Int. Cl.[4] G01L *5/16*; G01D *5/32*
U.S. Cl. 73—862.04 **16 Claims**



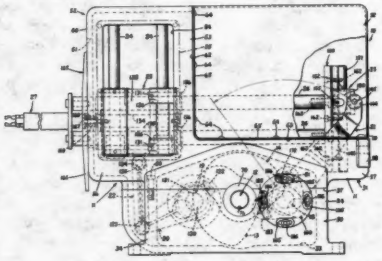
15. In a pressure transducer including a body having at least two surfaces spaced from each other by a predetermined amount in an undeformed state, a base abutting one of the surfaces with respect to which the other of the surfaces undergoes localized relative displacement in response to pressure and means mounted in the base for transmitting a signal medium through the body between said surfaces thereof with an intensity varied by said displacement of the other of the surfaces, the improvement comprising a plurality of passage holes formed in the body in alignment with said signal medium transmitting means at said one of the surfaces of the body, said body being made of a material limiting transmission of the signal medium to paths established through said passage holes and causing constriction of the passage holes in response to said displacement of the other of the surfaces to restrict said transmission of the signal medium along said paths.

4,599,909

LINEAR TRANSFER DRIVE FOR A PICK AND PLACE MATERIAL HANDLING APPARATUS

Frank H. Koller, Norridge, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 19, 1982, Ser. No. 435,312
Int. Cl.[4] F16H *25/08*
U.S. Cl. 74—27 **8 Claims**



1. In a mechanical drive mechanism, the combination comprising:

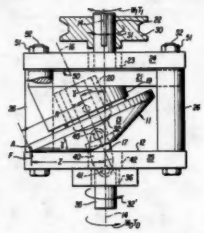
a housing, an input drive shaft adapted to be rotatably driven about a fixed axis traversing said housing, plural pairs of parallel plate cam means fixed to said drive shaft for rotation therewith, a pair of offset follower crank shafts rotatably mounted within said housing, cam follower means carried on each said offset crank shaft for engaging an associated pair of said plate cam means whereby to simultaneously and positively arcuately oscillate said offset crank shafts in response to rotational activity of said plural pairs of parallel plate cam means and drive shaft; said offset follower crank shafts operable to permit said plural cam means to transect the rotational axes of their respectively associated offset follower crank shafts in operation.

4,599,910

SPEED REDUCING AND TORQUE TRANSMITTING MECHANISM

John H. Francis, Charles Town, W. Va., assignor to Frederick Manufacturing Company, Frederick, Md.

Filed Sep. 29, 1982, Ser. No. 426,875
The portion of the term of this patent subsequent to May 7, 2002, has been disclaimed.
Int. Cl.[4] F16H *13/02, 13/10, 15/16*
U.S. Cl. 74—206 **9 Claims**



1. A speed reduction mechanism for transmitting torque less than a predetermined torque comprising:

a first shaft;

means for mounting the first shaft for rotation about a first axis;

a first bearing surface having as a generatrix at least a portion of a radially extending straight line intersecting the first axis at a point and rotating about the point through 360° at a constant angle with respect to the first axis;

a cone having a surface in direct, unlubricated engagement with the first bearing surface along a line of contact which is coincident with the radially extending straight line which forms a genetraix of the first bearing surface, the cone having an apex which is substantially coincident with the point on the first axis about which the generatrix rotates;

cone mounting means for mounting the cone to rotate about a second axis oblique with respect to the first axis and coincident with the axis of the cone, the second axis intersecting the point on the first axis about which the generatrix rotates;

means for connecting the cone mounting means to the first shaft to rotate the cone mounting means about the first axis in a first direction, wherein the conical surface revolves in the opposite direction around the point of intersection to the first direction as the conical surface rotates about the second axis so that the conical surface rolls over the first bearing surface in progressive line contact therewith without slipping with respect thereto until a torque is applied thereto which is greater than the predetermined torque;

a constant velocity joint connected to the cone at the apex thereof and aligned with the first axis;

a second shaft connected to the constant velocity joint and extending in alignment with the first axis, whereby the second shaft rotates at a speed less than the first shaft upon rotating the first shaft but with higher torque than that applied to the first shaft, and

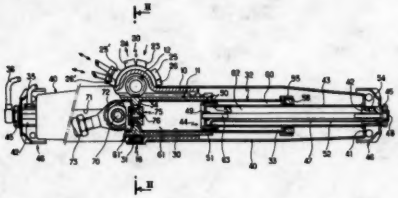
means for adjusting the force with which the conical surface is urged against the first bearing surface to adjust the predetermined torque, wherein torque in excess of the predetermined torque will not be passed through the mechanism from the first shaft to the second shaft due to slippage between the conical surface and the first bearing surface.

4,599,911

COMPACT ASSISTED STEERING MECHANISM FOR AN AUTOMOTIVE VEHICLE

Jorge E. Rosell, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Sep. 12, 1984, Ser. No. 650,748
Int. Cl.[4] B62D *3/12, 5/10*
U.S. Cl. 74—388 PS **12 Claims**



1. A compact power steering mechanism for a vehicle, comprising:

a stationary casing;

a rack body reciprocable within said casing and having teeth in meshing engagement with a pinion gear actuatable by an input shaft member;

a fluid pressure power unit including at least one stationary piston and a movable cylinder delimitating first and second pressure chambers on opposite sides of said stationary piston; and

distribution valve means operable by said input shaft member to supply selectively said first and second pressure chambers with fluid pressure;

further comprising at least one housing mounted on said casing and having one distal end wall, said stationary piston secured to one end of a piston rod having a peripheral surface, the piston rod extending within said housing and secured by another end to the distal end wall of said housing, said movable cylinder mounted within a cylindrical portion of said rack body and extending in prolongation thereof and coaxial with said piston rod, said movable cylinder supporting at an outer end a seal ring cooperating in sliding sealing engagement with said peripheral surface of said piston rod and delimitating said first pressure chamber on one side of said stationary piston, said second pressure chamber delimitated on another side of said stationary piston by an inner end wall portion of said movable cylinder.

4,599,912

ELECTRIC RESTART CONTROL

Michael A. Barnard; Arthur L. Urban; Bruce J. Kester; Anthony F. Beugelsdyk, and Dale C. Kester, all of Wichita, Kans., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 20, 1983, Ser. No. 459,408
Int. Cl.[4] F16C *1/10*; A01D *69/04, 69/10*
U.S. Cl. 74—501 R **7 Claims**

1. A power lawnmower control apparatus for engaging an electric ignition assembly having off, on and start positions, comprising:

handle means shiftable between a grasped position and a released position;

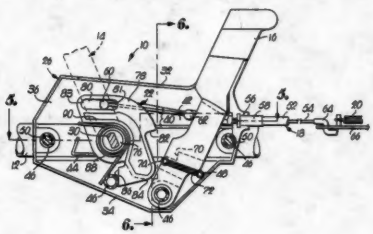
operating means comprising an elongated lever pivotally movable about one end thereof and including structure defining an aperture therethrough;

cable means received through said aperture and adapted for operative connection to said ignition assembly and shiftable between positions corresponding to said off, and on and start position of said ignition assembly;

means for biasing said cable means to said off position;

operating mechanism operably coupled to said cable means and said handle means for shifting of said cable means to said on position in response to shifting of said handle means from said released position to said grasped position, said cable means including an end fitting, said operating mechanism including structure defining a slot therein, said cable end fitting being received within said slot in reciprocating relationship thereto; and

engageable means operably coupled to said cable means, and



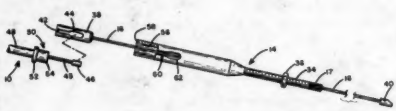
spaced apart from said operating mechanism when said cable means are out of said start position, for engagement by said operating means and subsequent shifting of said cable means from said on position to said start position when said cable means are in said on position and said engageable means are movably engaged by said operating means.

4,599,913

ADJUSTABLE RELEASABLE CABLE COUPLING DEVICE

Wayne Dawson, Prairie Plaza Sta., Box 2233, Beulah, N. Dak. 58523

Filed Feb. 15, 1984, Ser. No. 580,206
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501 R **2 Claims**



1. In a control assembly for a machine in which a manually operated lever is coupled to a control member by means of a flexible cable disposed within a tubular sheath, said control member being disposed within a sealed housing, means for adjustably coupling said flexible cable to said control member comprising, in combination:

(a) a first control cable member having a cable segment with a proximal and a distal end, said distal end being fastened to said control member, said proximal end extending outward of said housing and having a tubular receptacle having an opening extending through the sidewall of said tubular receptacle and communicating with the central bore of said tubular receptable;

(b) a tubular sleeve member surrounding a portion of said first cable segment, said tubular sleeve member having a threaded shank portion, the bore of said tubular sleeve having a diameter greater than the outer diameter of said tubular receptable such that said tubular receptacle can be slideably received within the bore of said tubular sleeve member, said tubular sleeve member having an opening like that in said tubular receptacle extending through the sidewall thereof communicating with the bore of said tubular sleeve member, said threaded shank portion passing through a threaded aperture in said housing to allow tension adjust of said first control cable; and

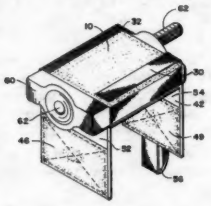
(c) a second control cable member having an outer sheath and a central cable segment slideably received therein, said central cable segment having a proximal end and a distal end, said proximal end adapted to be coupled to said manually operated lever, said distal end having an enlarged tip of a size which can pass through said openings in said tubular sleeve member and in said tubular receptacle when said openings are aligned one with the other.

4,599,914

BICYCLE PEDAL GRIPS

William R. Dunn, 15215 S.W. 78th Pl., Miami, Fla. 33157, and Richard F. Dea, 9701 N.W. 14th St., Plantation, Fla. 33322

Filed Jul. 13, 1983, Ser. No. 513,467
Int. Cl.[4] G05G *1/16*
U.S. Cl. 74—563 **7 Claims**



1. A bicycle pedal grip in combination with a bicycle pedal comprising:

a first mating portion having a flexible central band attached at least in part to the bicycle pedal by wrapping said central band around the pedal, at least one first mating portion adherence panel connected thereto, and at least one fastening strap connected to the first mating portion at substantially right angles to the direction said central band is wrapped around the pedal, said fastening strap being wrapped around an inside edge of the pedal and having adherence properties with respect to and being removably adhered to at least one first mating portion adherence panel whereby said first mating portion is prevented from slipping outward along the pedal but is readily removable therefrom; and

a second mating portion having a flexible central band, at least one second mating portion adherence panel connected thereto and having adherence properties with respect to at least one first mating portion adherence panel, said second mating portion being attachable to a sole of a foot of a bicyclist at least in part, in readily removable manner, by wrapping said second mating portion about a ball of the foot.

4,599,915

ADJUSTABLE PEDAL

Harry F. Hlavac, 278 Tamalpais Ave., Mill Valley, Calif. 94941, and Erik B. Koski, Larkspur, Calif., assignors to Harry F. Hlavac, Mill Valley, Calif.

Filed Jan. 6, 1984, Ser. No. 568,596
Int. Cl.[4] G05G *1/14*
U.S. Cl. 74—594.4 **6 Claims**

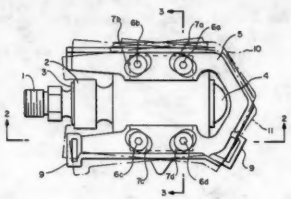
2. An adjustable pedal, comprising:

(a) a platform mounted on a shaft for supporting a foot;

(b) means permitting said platform to pivot about a radial axis generally perpendicular to the axis of said shaft to provide toe-in and toe-out positions for the foot;

(c) means permitting said platform to tilt about a radial axis generally perpendicular to said shaft axis to provide inverted and everted positions for the foot;

(d) means for positioning said platform along a radial axis generally perpendicular to said shaft axis to provide a lifted position for the foot; and



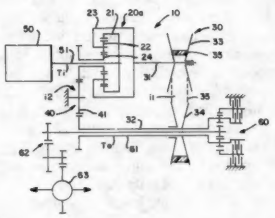
(e) means for fixing the pivot, tilt and lift positions of said platfrom into different predetermined set foot positions as respects said shaft and as required for individual biomechanical balance.

4,599,916

CONTINUOUSLY VARIABLE TRANSMISSION INCLUDING PLANETARY GEARING

Koichiro Hirosawa, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 8, 1984, Ser. No. 587,621
Claims priority, application Japan, Mar. 10, 1983, 58-38235
Int. Cl.[4] F16H *37/00, 37/06*
U.S. Cl. 74—689 **5 Claims**



1. A continuously variable transmission comprising;

an input shaft,

an output shaft,

a gearing interposed between the input and output shafts and having at least three members which form a gear train,

a clutch mechanism interposed between the gearing and the output shaft,

a variable speed change portion having a pair of speed change members,

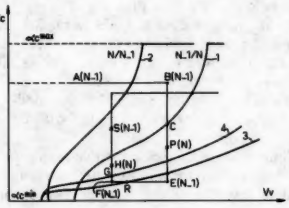
one of said three members being connected to the input shaft, the two others of said three members being connected respectively to the speed change members forming the pair in the variable speed change portion,

one of said speed change members which form the pair being driven by the other and connected to the output shaft the gearing including a first and a second members consising of a first and a second gears, respectively, and third members consisting of a single pinion gear and a carrier, the pinion gear meshing with the first and second members, the pinion gear being carried by the carrier, the third member connected to the input shaft, and wherein the first and second members are connected to their respective ones of said speed change members which form the pair.

4,599,917
RATIO CHANGE CONTROL IN AN AUTOMATIC TRANSMISSION WITH STEPPED RATIOS

Francois Léorat, Versailles, and Gerard Pannier, Neauphle le Chateau, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 2, 1984, Ser. No. 606,225
Claims priority, application France, May 2, 1983, 83 07277
Int. Cl.⁴ B60K *41/08*
U.S. Cl. 74—866 **3 Claims**



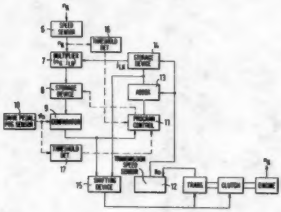
1. In an automatic transmission with stepped ratios for a vehicle of the type wherein a governor generates, for each transition between two successive ratios, namely a lower ratio and a higher ratio, an up shift curve and a down shift curve of the transmission ratio in a plane of throttle openings and vehicle speeds and produces either the change to said higher ratio when a point representing the operation crosses, through increasing speed or decreasing throttle speed, the up shift curve, or the change to said lower ratio when the representative point crosses the down shift curve in the direction of decreasing speeds or increasing throttle openings with, for at least one transition, a system inhibiting untimely changes into said higher ratio, the improvement wherein said system is arranged so that a negative acceleration curve is first generated which is located at least for medium and high vehicle speeds below the up and down shift curves and an increasing opening curve located slightly above the negative acceleration curve and wherein said system only enables the change up to said higher ratio of the value of the opening stops changing for a minimum time and if said representative point in said plane lies either between the up shift curve and the negative acceleration curve if the throttle opening varies in the decreasing direction, or between the increasing opening curve and the up shift curve if the throttle opening varies in the increasing direction.

4,599,918
CONTROL SYSTEM FOR A MOTOR VEHICLE DRIVE UNIT

Norbert Stelter, Weissach; Rainer Wuest, Wiernsheim; Peter op de Beeck, and Gerd Bofginer, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,530
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223555
Int. Cl.⁴ B60K *41/08*
U.S. Cl. 74—866 **10 Claims**

1. A control system for a motor vehicle drive unit including a reciprocating piston engine and a change-speed transmission means with a clutch, comprising first sensing means for sensing the clutch output rotational speed, second sensing means for sensing the position of a drive pedal means for the selective adjustment of the engine output power, a control apparatus, each sensing means being operative with their respective outputs connected to corresponding inputs of the control apparatus, and adjusting means actuated by said control apparatus for selectively engaging the transmission speeds of the change-speed transmission means, said control apparatus including circuit means for keeping the engine output power essentially constant at the value adjusted by the drive pedal means, first storage means for storing characteristic data describing the engine output power as a function of the engine rotational speed, second storage means for storing changing values of the transmission ratio corresponding to the individual transmission speeds, said control apparatus further including means for engaging the highest possible speed in the transmission in

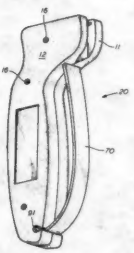


accordance with measured values from said sensing means and storage values from said first and second storage means, at which the engine output power corresponding to the drive pedal position does not exceed the engine output power function described by the characteristic curve in said first storage means.

4,599,919
SHARPENING DEVICE

Roland D. Fortenberry, 16144 Forest Bend Ave., Friendswood, Tex. 77546

Filed Feb. 27, 1984, Ser. No. 583,710
Int. Cl.⁴ B21K *11/00*
U.S. Cl. 76—86 **7 Claims**



1. A sharpening device comprising:

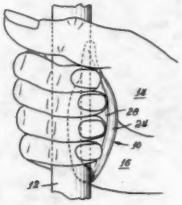
sharpener holder means comprising a pair of opposed, releasably joinable, side portions, each said side portion having a laterally extending outer surface, said holder means having a pair of sharpener members carried thereby, said sharpener members each having opposed beveled sides forming a cutting and a trailing edge on each said side, said sharpener members being positioned perpendicular to said holder means' said outer surfaces and so oriented relative to said holder means that each said cutting edge leads its respective said trailing edge relative to a device to be sharpened, and

means carried by each of said side portions for reversing the orientation of said sharpener members.

4,599,920
POWER GRIP INSERT

Rainer Schmid, Eugene, Oreg., assignor to Orthopedic Design, Inc., Eugene, Oreg.

Filed Aug. 22, 1983, Ser. No. 525,151
Int. Cl.[4] B25G 1/00
U.S. Cl. 81—489 7 Claims



1. A hand grip device for use in gripping an instrument having a handle shaft, comprising:

insert means for filling the space between the palm of a hand and said handle shank, said insert means having

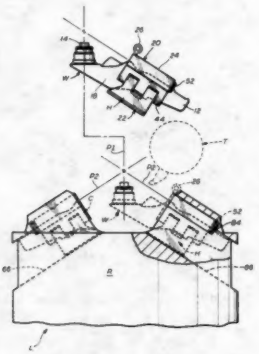
(a) a first surface area contoured to conform to the palm of a hand, said surface area including a first and second dished supporting area which are angled with respect to each other at about 149 degrees and are each contoured respectively to the thenar and hypothenar eminence musculature of the hand with the hand in a relaxed state, and

(b) a second surface area contoured to conform to the handle shank of said instrument.

4,599,921
METHOD AND APPARATUS FOR MACHINING A WORKPIECE

Paul I. Gaither, Friendswood, and Joseph R. Tucker, III, Pasadena, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Nov. 29, 1984, Ser. No. 676,244
Int. Cl.[4] B23B 1/00, 33/00
U.S. Cl. 82—1 C 8 Claims



1. Apparatus for machining a bearing journal on the end of an elongated drill bit body section mounted on the rotary table of a lathe for rotation about a vertical axis comprising:

a holder adapted to be removed from and installed on said rotary table, said holder including a pair of interfitting body portions removably secured about the bit body section and means for accurately positioning the bit body section within the interfitting body portions at a precise predetermined position with the bearing journal on which the machining is to be performed extending outwardly from the holder;

said rotary table having a generally laterally extending pocket therein defined by a receiving opening adjacent the axis of rotation of said rotary table and upper and lower generally parallel planar surfaces inclined downwardly from said receiving opening so that the holder and bit body section are received within said opening and easily slide into initial position within the pocket supported loosely on said lower planar surface while slightly spaced below said upper planar surface;

releasable securing means on said lathe for engaging said holder and pressing said holder against said upper planar surface in a secured position while spaced slightly above said lower planar surface for accurately positioning said holder and bit body portion within said pocket so that the bearing journal is vertically aligned with the axis of rotation of said rotary table; and

a machining tool on the lathe for machining said journal.

5. A separate holder for an elongated drill bit body section for removable insertion within a pocket of a rotary turning lathe for machining a bearing journal on said bit body section comprising:

a pair of interfitting body portions removably secured about the bit body section and accurately positioning the bit body section therebetween at a precise predetermined location with the bearing journal on which the machining is to be performed extending outwardly from the holder;

one of said body portions being an upper body portion for positioning adjacent a machining tool on the lathe and the other body portion being a lower body portion remote from said machining tool;

said upper body portion having a planar upper surface, a pair of spaced lower planar surfaces along opposed lower marginal edge portions of said upper body portion defining ledges for supporting said holder on said lathe, at least one depending lug adjacent each of said marginal edge portions, and a pair of workpiece contact faces on the lower surface of the upper body portion between the supporting ledges and the lugs, said contact faces being arranged at an angle of one hundred twenty degrees (120°) with respect to each other for contacting said drill bit body section along faces thereof arranged at one hundred twenty degrees (120°) with respect to each other;

said lower body portion having at least a pair of lugs interfitting with said lugs on said upper body portion and spaced from each other to define a supporting surface therebetween for contacting and supporting the drill bit body section thereon; and

means releasably connecting said lugs on said upper and lower body portions to each other at a precise location with the drill bit body section gripped therebetween in contact with said contact faces on the upper body portion and said supporting surface on said lower body portion for accurately positioning of the bearing journal for machining.

6. A method for machining a workpiece mounted on the rotary table of a lathe for rotation about a vertical axis comprising the steps of:

first gripping the workpiece accurately at a location removed from the lathe between two mating portions of a removable workpiece holder in a predetermined position with a portion of the workpiece on which the machining is to be performed extending outwardly from the holder;

next inserting the holder with the workpiece accurately gripped therein within a generally laterally extending downwardly inclined pocket of the rotary table positioned adjacent the axis of rotation thereof so that the holder and workpiece easily slide into position within the pocket aided by gravity;

then securing the holder and workpiece accurately at a predetermined location within the pocket so that the extending portion of the workpiece is positioned precisely

with respect to the axis of rotation of said rotary table for machining by a machining tool on the lathe; and

next machining the journal by said machining tool upon rotation of said rotary table.

4,599,922

METHOD OF MANUFACTURING AN ECCENTRIC SHAFT

Thomas L. Behnke, Durand, Mich., assignor to Lukens General Industries, Inc., Coatesville, Pa.

Division of Ser. No. 149,164, May 30, 1980, Pat. No. 4,460,346.
This application Apr. 16, 1984, Ser. No. 600,835
Int. Cl.⁴ B23B *1/00, 5/24*
U.S. Cl. 82—1 C **3 Claims**

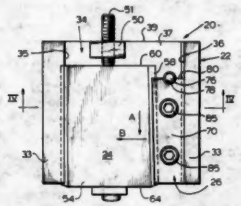
1. A method of forming an eccentric shaft having, at each end, a first cylindrical bearing surface, for support by a frame, separated axially by an elliptical surface from a second cylindrical bearing surface axially offset from said first bearing surface for supporting a surface to be vibrated and imparting vibratory movement to said surface, from an elongate workpiece comprising: mounting said workpiece for rotation about first one longitudinal axis and then another longitudinal axis; cutting material from end portions of said workpiece about one axis to form said first cylindrical bearing surface in each end of said workpiece, and cutting another adjacent portion of said workpiece at each end about said axis; cutting material from still another adjacent portion of said workpiece at each end about a different axis to form said second cylindrical bearing surface at each end, and cutting material from said cut another section at each end about said different axis to elliptically configure said another section at each end of the workpiece, the axes being so offset that the sequential cutting of material from the said another section at each end about different axes forms an elliptical section at each end with a major and minor axis of differing length, the major axis being no greater in length than the diameter of one of the said two cylindrical bearing surfaces formed at each end.

4,599,923

TOOL BIT AND HOLDER ASSEMBLY

George R. Church, Lockport, and Roger J. Kocian, Worth, both of Ill., assignors to CHUR-IAN, Ltd., Lockport, Ill.

Filed May 30, 1985, Ser. No. 739,118
Int. Cl.⁴ B23B *29/04, 29/24*
U.S. Cl. 82—36 R **6 Claims**



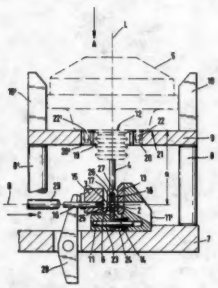
1. A machine tool bit and holder assembly comprising: tool holder means comprising a unitary body having means for attachment to a mounting tool post, and a longitudinal groove formed in one planar face thereof, said groove having a planar bottom wall and parallel, longitudinally extending angularly inclined planar side walls intersecting said bottom wall; tool bit means mounted in said groove comprising an elongated metal body of generally trapezoidal cross section and formed with elongated, planar lateral flanks, the planes of which flanks converge rearwardly from a work engageable cutting edge formed at one end of said metal body; said flanks also converging upwardly from the bottom wall of said groove, one of said flanks abuttingly engaging one side wall of said groove; elongated wedge means mounted in said groove and having longitudinally divergent planar sides to matingly engage with the other flank of said tool bit means and the other side wall of said groove; and means operable to force said wedge means toward said bottom wall of said groove whereby to apply forces on said tool bit acting along three generally right angularly related axes whereby to anchor the tool bit means in operative position in said groove.

4,599,924

PROCESS AND DEVICE TO APPLY A BEARING EYE OR A TRANSVERSE PERFORATION IN THE CLEVIS OF THE ACTUATING ROD OF A BRAKE POWER BOOSTER

Gerd Klostermann, Friedrichsdorf, and Nabil Henein, Darmstadt, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 20, 1984, Ser. No. 622,707
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1983, 3322423
Int. Cl.⁴ B23D *21/14*
U.S. Cl. 83—50 **5 Claims**



1. A process to produce a bearing eye or a transverse perforation in a pair of legs of a clevis adapted to be rigidly secured to a free end of an actuating rod extending from a casing of a brake power booster having a fixation flange adapted to be mounted to a surface of a vehicle, said transverse perforation in the legs of the clevis adapted to receive a pivot pin of a brake operating lever, the invention in which the steps comprise first inserting an assembled brake power booster in a locking frame with said clevis retained by a cutting tool at a rated design distance from said fixation flange of the booster casing and thereafter moving a cutting punch transversely to the longitudinal direction of said actuating rod to enable said cutting punch to cut a patch or segment out of at least one of said pair of legs of said clevis.

4,599,925

FIBERBOARD CUTTING SYSTEM

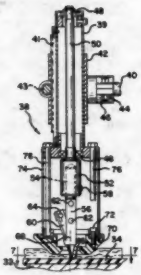
Rudolph A. Rom, Woodridge, Ill., assignor to The Lockformer Company, Lisle, Ill.

Filed May 7, 1984, Ser. No. 607,791
Int. Cl.⁴ D06H *7/00*
U.S. Cl. 83—56 **26 Claims**

1. An apparatus for cutting insulation comprising a table for supporting the insulation, a cutter, mounting means for the cutter to hold the cutter above the table whereby the cutter is

adapted to engage insulation supported on the table, vertical adjustment means for the cutter for locating the cutter in position to penetrate the insulation, drive means for said mounting means whereby the cutter can be driven longitudinally and transversely of the table for cutting the insulation into various shapes, and hold-down means pressing against the insulation during the cutting to thereby prevent displacement of the insulation relative to said table, said cutter comprising a cutting blade of the type defining a leading cutting edge portion, a narrow body portion trailing said cutting edge portion, and a lower end, a vertical shaft supporting said blade, and means rotatably supporting said shaft whereby the shaft and blade have unrestrained freedom of movement during a cutting operation, said table including a supporting surface adapted to be penetrated by said end during the cutting operation, and wherein a plane parallel to the axis of said vertical shaft and including said end is offset relative to said axis.

15. A method for cutting insulation comprising the steps of



supporting the insulation on a table, providing a cutter comprising a cutting blade, providing a collar for said blade, mounting the cutter and associated collar on means holding the cutter above the table whereby the cutter is adapted to engage insulation supported on the table, driving the cutter longitudinally and transversely of the table for cutting the insulation into various shapes, and rotatably supporting said blade whereby the blade has unrestrained freedom of movement during a cutting operation, said blade defining a leading cutting edge portion, a narrow body portion trailing said cutting edge, and a lower end, and wherein a line parallel to the axis of said vertical shaft and extending through said end is offset relative to said axis, and including the step of locating said end whereby said end penetrates the surface of said table during the cutting operation, said collar surrounding said blade, and including the step of pressing said collar against said insulation during the cutting operation whereby said collar penetrates into the insulation and stabilizes said cutter as the cutter moves during a cutting operation.

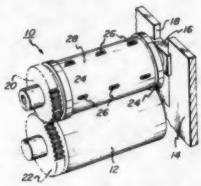
4,599,926

ROTARY CUTTING DIES WITH VACUUM ASSIST TO CUT AND CLEAR WASTE

Leroy H. Carlson, Jr., East Hartford, and Martin Kesten, West Hartford, both of Conn., assignors to Preston Engravers, Inc., Windsor, Conn.

Filed Jul. 16, 1984, Ser. No. 631,193
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—100 **15 Claims**

1. A rotary device for cutting holes and other shapes in web materials, and for clearing the waste therefrom, comprising a roll having an axial passage opening at least at one end, and a multiplicity of generally radial channels extending from said passage to the exterior cylindrical surface thereof, a corresponding multiplicity of die elements on said cylindrical surface adjacent the outer openings of associated channels, providing cutting edges thereabout configured for cutting waste fragments from the web material, and a multiplicity of air vent ports, each of said ports extending from said cylindrical surface at a point adjacent the opening of an associated one of said channels and intersecting said associated channel inwardly thereof to define inner and outer sections therein, whereby air



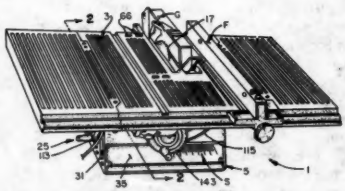
may be drawn through said ports to assist movement of waste fragments, removed from the web by said die elements, through the inner sections of said channels and into said axial passage of said roll.

4,599,927

TOOL ELEVATION AND BEVEL ADJUSTMENT FOR DIRECT DRIVE POWER TOOL

Curtis J. Eccardt, County of St. Charles, and Arnold L. Smith, County of St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 8, 1985, Ser. No. 731,732
Int. Cl.[4] B27B *5/24*; B26D *1/14*
U.S. Cl. 83—473 **8 Claims**



1. In a direct drive power tool having a table, a base supporting said table, an electric motor including a rotor shaft, and a tool secured to and rotatable with said rotor shaft, wherein the improvement comprises: means carried by said table for mounting said motor thereto and means for selectively adjusting the elevation of said motor and said tool carried by said rotor shaft relative to said table, said mounting means comprising a cradle plate secured to the bottom of said table, said cradle plate having a pivot aperture therein, said motor being pivotally mounted on said cradle plate for pivotal movement of said motor relative to said cradle plate about said pivot aperture, said elevation adjustment means comprising a manually adjustable elevation screw drive for effecting said pivotal movement of said motor about said pivot aperture thereby to elevate said rotor shaft carrying said tool toward and away from said table, a link having its inner end pivotally secured to said motor at a point distal from the mounting of said motor with respect to said pivotal aperture, an abutment carried by said cradle plate, said elevation drive screw extending through said abutment, means for transferring thrust loads between said elevation drive screw and said abutment, a handle for manually rotating said elevation drive screw, and a trunnion nut threadably engageable with said elevation drive screw and being pivotally secured with respect to said link for permitting relative pivotal movement between said elevation drive screw and said link about an axis generally perpendicular with respect to the axis of said elevation drive screw, said link having a pair of spaced trunnion openings therein for receiving portions of said trunnion nut, said trunnion nut comprising first and second trunnion parts, each of said trunnion parts having an inner surface having threads therein engageable with said elevation

drive screw, and an outer surface including a trunnion received in a respective said trunnion opening in a respective said trunnion opening in said link, and means for securing said trunnion parts together such that the threads on said inner surfaces of said trunnion parts threadably engage said elevation drive screw.

4,599,928

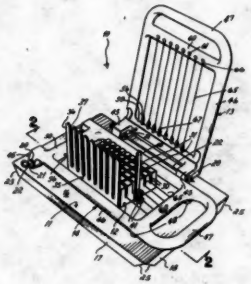
APPARATUS FOR FORMING CUBES FROM A PRODUCT SUCH AS A LOAF OF CHEESE

Thomas W. Oker, Cincinnati, Ohio, assignor to Tom Oker Sales & Mfg., Inc., Cincinnati, Ohio

Filed Apr. 10, 1985, Ser. No. 721,766

Int. Cl.[4] B26D *1/547*

U.S. Cl. 83—581.1 **8 Claims**



1. Apparatus for forming cubes from a product comprising;
a base;
a block mounted on said base and having a plurality of spaced parallel grooves in the upper surface thereof in a longitudinal direction and intersecting spaced parallel grooves in a transverse direction;
a lower bow pivotally mounted on said base;
an upper bow pivotally mounted on said base on an axis perpendicular to the axis of said lower bow;
each said bow having a frame creating an opening through which said block passes when said bow is swung to a horizontal position parallel to said base;
each said bow having a plurality of cutting wires stretching across said opening and aligned with respective grooves in said block;
each said wire having a loop at each end;
each said frame having a plurality of spaced studs projecting from one end of said frame, each said stud receiving a loop from one end of a respective cutting wire;
each said frame having a plurality of shouldered bores in the other end of said frame opposite respective lugs;
a headed pin located in each said bore and having a slotted shank projecting through said bore to receive a loop from the other end of each said wire;
and a compression spring disposed in each said bore between a shoulder and the head of a pin to apply tension to said wire.

4,599,929

METHOD OF GUIDING SAW BLADES AND DEVICE FOR CARRYING OUT THE METHOD

Hans Dutina, Saltsjö-boo, Sweden, assignor to Hans Dutina AB, Sweden

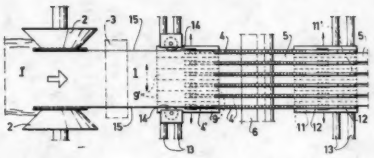
Filed May 21, 1984, Ser. No. 612,253

Claims priority, application Sweden, May 27, 1983, 8302997; Aug. 19, 1983, 8304524

Int. Cl.[4] B27B *7/04*

U.S. Cl. 83—821 **23 Claims**

1. A method of guiding the blades of a circular saw in operation, for example for the sawing of saw timber, timber blocks, battens or other workpieces of wood or wood products, where at least one blade is provided and located on an axle and guided by at least one saw guide acting on the blade from the two opposing sides of the blade, in the case of more than one blade, characterized in that: for each blade (4) providing a movable



saw guide (9,11), which saw guide (9,11) during the sawing is permitted to be movable substantially in the axial direction of the blade (4) for displacement substantially in the axial direction of the blade; continuously laterally positioning the saw guide in response to the axial movements and axial position of at least one of the elements the workpiece (1) being sawn and the blade (4) in association with the saw guide (9,11).

4,599,930

ELECTRONIC MUSICAL INSTRUMENT WITH TOUCH RESPONSE FUNCTION

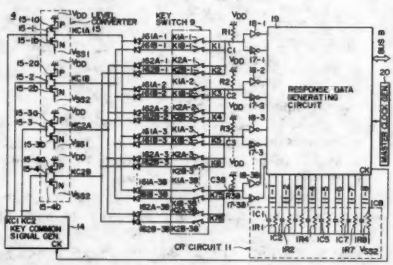
Naoki Takahashi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,448

Claims priority, application Japan, May 25, 1984, 59-104437; Jun. 9, 1984, 59-118843

Int. Cl.[4] G10H *1/46*

U.S. Cl. 84—1.1 **9 Claims**

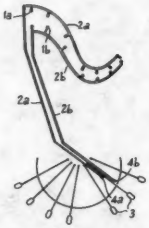


1. An electronic musical instrument with touch response function comprising:
a keyboard with a plurality of keys each having first and second key switches operable at different timings;
means for supplying first and second voltage signals at different voltage levels to said first and second key switches, respectively;
means for obtaining first and second key output signals based on said first and second voltage signals from said first and second key switches; and
means for generating a tone signal with a touch response provided according to said first and second key output signals.

4,599,931
CONCERT HARPS

Joël Garnier, La Chappelle Saint Florent, France

Filed Aug. 9, 1983, Ser. No. 521,554
Claims priority, application France, Aug. 9, 1982, 82 13840
Int. Cl.[4] G10D *1/04*; G10C *3/04*
U.S. Cl. 84—265 14 Claims

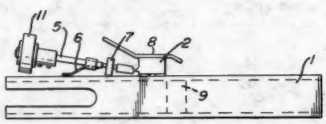


1. A concert harp comprising a frame, a plurality of strings carried by said frame, and means for shortening the vibrating length of said strings in order to set up the tuned note of said string, said means comprising for each string two jaws movable in a direction transverse to the string toward and away from the string to clamp the string between the jaws, a hydraulic pressure actuated micro-jack having means operable on said jaws, and means mechanically connected with said two jaws for moving said two jaws in said direction by said operable means.

4,599,932
HANDCHIME WITH ELASTOMERIC HINGE

Jacob H. Malta, 21 Bell La., New Britain, Pa. 18901

Filed Jan. 3, 1984, Ser. No. 567,655
Int. Cl.[4] G10D *13/06*
U.S. Cl. 84—404 12 Claims



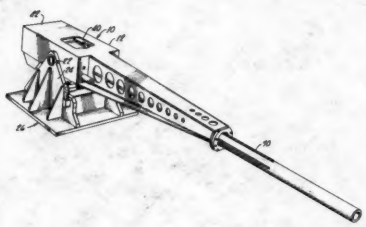
12. A handchime, comprising:
(a) a main tube having two opposite open ends;
(b) the first of said ends being forked and having tines;
(c) the second of said ends being suitable for grasping as a handle;
(d) an adjustable tuning plug within said main tube between said ends dividing said main tube into two sound chambers, and
(e) clapper means for striking said tines, said clapper means being attached to said main tube by hinge means.

4,599,933
BREECH/RECEIVER ASSEMBLY FOR AUTOMATIC CANNON

Eugene M. Stoner, Palm City, Fla., assignor to Ares, Inc., Port Clinton, Ohio

Filed Dec. 8, 1983, Ser. No. 559,304
Int. Cl.[4] F41F *11/075*
U.S. Cl. 89—9 4 Claims

1. A breech/receiver assembly for automatic cannon having a barrel comprising:
a receiver having trunion means for pivotally supporting the receiver in a gun mount;
a breech having means defining a first aperture therein for receiving a chamber and a second aperture therein, communicating with said first aperture and adapted for receiving the barrel at an outside end thereof, said breech being slidably mounted within the receiver;
a chamber having means defining an opening therethrough sized for accepting ammunition, said chamber being mounted within the breech first aperture for rotational movement about a chamber axis from a first position in which the opening therein is aligned with the breech second aperture and barrel and a second position in which the opening therein is disposed at an angle with said breech second aperture and aligned for simultaneously accepting ammunition from a point outside the breech and ejecting ammunition casings therefrom, said chamber axis being coaxial with said trunion means when the chamber aperture is aligned with the breech first aperture and the breech is in battery position;

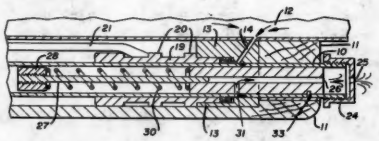


combination recoil and counterrecoil buffer means disposed within said breech block for buffering barrel recoil and counterrecoil forces as the breech slides within the receiver;
means for controlling the rotational movement of the chamber to enable the chamber to align with a fixed aperture feeder assembly independent of the elevation angle of the breech/receiver assembly, said means for controlling the rotational movement of the chamber including a stop fixed to a nonmoving portion of the automatic cannon,
and a double acting hydraulic cylinder means disposed in an operative relationship between the cylinder and the receiver for rotation of the chamber from an open to a closed position and including means for disconnecting said cylinder means from the chamber upon recoil sliding movement of the breech block within the receiver.

4,599,934
GAS OPERATED FIREARM

Larry A. Palmer, 1554 Duffus Dr., Howland Township, Trubull County, Warren, Ohio 44484

Filed Jul. 18, 1984, Ser. No. 631,987
Int. Cl.[4] F41D *5/08*
U.S. Cl. 89—193 5 Claims



1. In a firearm in which the explosion gases act to automatically eject empty shells and including a barrel and a magazine tube, a gas cylinder communicating with the barrel and a sleeve movable along said magazine tube and connected to an ejection mechanism, the improvement comprising the magazine tube having an opening therein and a passageway thereabout communicating with said opening; a cylindrical body

positioned in said magazine tube having an axial bore and a transverse passageway communicating with said axial bore and with said opening in said magazine tube; an elongated valve rod slidably disposed in said axial bore and extending outwardly therefrom, a shell follower on the outermost end of said valve rod and spring means between said shell follower and said cylindrical body urging said valve rod outwardly of said axial bore, said valve rod movable from a first position outwardly of said cylindrical body to a second position inwardly of said cylindrical body in closing relation to said transverse passageway therein, an apertured closure on an end of said magazine tube whereby explosive gases in said firearm can be vented to atmosphere when said valve rod is in said first position and said explosion gases can move said sleeve and activate said shell ejection mechanism of said firearm when said valve rod is in said second position.

4,599,935

PLUNGER PISTON FOR INTERNAL COMBUSTION ENGINES

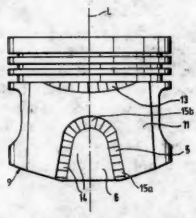
Jürgen Ellermann, Winnenden, and Horst Pfeiffenberger, Fellbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH

Filed Oct. 18, 1984, Ser. No. 662,094

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1983, 3338474

Int. Cl.[4] F01M *1/04*

U.S. Cl. 92—159 12 Claims



1. In a piston for internal combustion engines having a piston head, a cylindrical skirt connected at one end to said head, and two gudgeon pin bosses having bores located on a common axis and extending radially inwards from said skirt, said skirt having within a cylindrical generatrix circumferentially extending thrust and anti-thrust bearing surfaces disposed between the gudgeon pin bosses, the improvement comprising the provision of a recess formed in at least one of said thrust and anti-thrust bearing surfaces, said recess being positioned remote from the piston head end of the skirt, which recess extends circumferentially around the skirt and terminates circumferentially within the zone of said bearing surface and which is open at one end only in a direction away from the piston head end of the skirt entirely across the circumferential extension of the recess and is closed at an opposite end remote from said one end by a surface which is inclined towards the longitudinal axis of the piston away from said cylindrical generatrix to form therewith a wedge having its wider end disposed nearest the end remote from the head end of the skirt, whereby when said piston is reciprocating within a cylinder, a hydrodynamic wedge of lubricating oil is created between the skirt and the cylinder walls within the recess thereby serving to guide the piston.

4,599,936

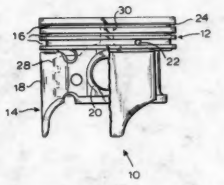
INTEGRAL STRUT AND PISTON GROOVE PROTECTOR

Thomas J. Bedwell, Holland, Mich., and Earl J. Clarke, Fountain Town, Ind., assignors to Wickes Manufacturing Company, Southfield, Mich.

Filed Apr. 22, 1985, Ser. No. 726,251

Int. Cl.[4] F16J *1/04*

U.S. Cl. 92—228 17 Claims



1. An integral strut and groove protector assembly for a piston comprising:

a ring groove protector having an arcuate body traversing an arc of less than one hundred eighty degrees;

an expansion control strut for controlling the thermal expansion of a piston; and

a connecting member connecting said ring groove protector and said expansion control strut, said connecting member having a bend therein.

4,599,937

MACHINE FOR MAKING ESPRESSO COFFEE, PARTICULARLY FOR DOMESTIC USE

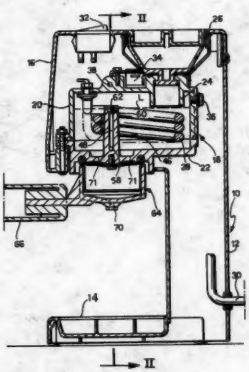
Roberto Ghione, Alfiano Natta, Italy, assignor to Hogar S.r.l., Turin, Italy

Filed Feb. 8, 1985, Ser. No. 699,866

Claims priority, application Italy, May 29, 1984, 53440/84[U]

Int. Cl.[4] A47J *31/30*

U.S. Cl. 99—293 4 Claims



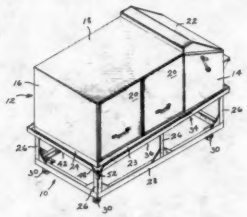
1. A machine for making espresso coffee, particularly for domestic use, comprising a boiler having electrical heating resistors and defining a sealable aperture for the introduction of water, and a filter cup releasably attached beneath the boiler and connected thereto, wherein the boiler defines a lower zone for containing water and an upper zone above the maximum level reachable by the water in the lower zone, and wherein the boiler is connected to the filter cup by an upwardly-extending pipe, the pipe communicating at its lower end with the lower zone of the boiler for discharging the water therein and at its upper end with the upper zone of the boiler for the subsequent discharge of steam.

4,599,938

GREASE AND LIQUID DRAINAGE MEMBER FOR A BARBEQUE COOKER

Dean Gongwer, 66740 Co. Rd. 103, Wakarusa, Ind. 46573

Filed Aug. 30, 1985, Ser. No. 771,286
Int. Cl.[4] A47J 37/00
U.S. Cl. 99—446 4 Claims



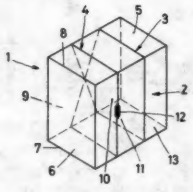
1. A grease and liquid drainage support for a barbeque cooker having sides and ends, said drainage support comprising a frame having longitudinal side members and transverse end members and adapted for floor or ground supporting contact, a continuous trough carried by said frame side and end members, said frame adapted to support said cooker when sat upon the frame with said cooker sides and ends extending over said trough, said trough constituting means for collecting grease and liquid from food as it is cooked within the cooker.

4,599,939

PROCESS FOR WRAPPING SQUARE BALES

Gerold Fleissner, Chur, Switzerland, assignor to Vepa Aktiengesellschaft, Riehen, Switzerland

Filed Dec. 31, 1984, Ser. No. 687,755
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3347397
Int. Cl.[4] B65B 13/02
U.S. Cl. 100—2 7 Claims



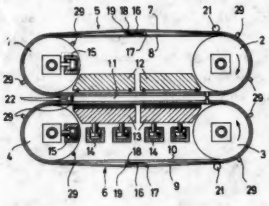
1. A process for the wrapping of square bales with the aid of a flexible wrapping material characterized in that the wrapping material is continuously wound at least two times around the bale on four sides, that the turns of the winding material extend, on at least two mutually opposite bale sides, only in parallel to each other, as well as in parallel to the bale edges, and that on one of the four bale sides, two of the turns of the wrapping material intersect obliquely with each other.

4,599,940

CONTINUOUSLY OPERATING PRESS FOR PRESSING AN ADVANCING WEB OF MATERIAL

Kurt Held, Alte Strasse 1, 7218 Trossingen 2, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,835
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334584
Int. Cl.[4] B30B 9/24
U.S. Cl. 100—154 20 Claims



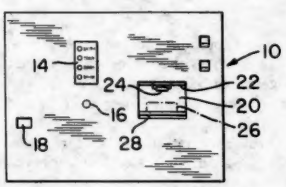
1. A continuously operating press for pressing an advancing web of material including in combination a first pair of deflection rollers, an upper endless press band guided over said first pair of deflection rollers, a second pair of deflection rollers, a lower endless press band guided over said second pair of deflection rollers, said press bands forming a press zone for a web of material located between the lower strand of the upper press band and the upper strand of the lower press band, each of said upper and lower press bands comprised of several interlocking band layers having mutually contiguous surfaces, and means for lubricating said mutually contiguous surfaces of said interlocking band layers.

4,599,941

APPARATUS FOR CRUSHING CONTAINERS

Ronald C. Johnson; Rex M. Johnson, both of Mahopac; Henry Jankowiak, Thomas J. Morley, both of Suffern, and Robert P. Dingwall, Mahopac; Henry R. Heimerich, Lynbrook, all of N.Y., assignors to Boro Recycling, Inc., Brooklyn, N.Y.

Filed Nov. 27, 1984, Ser. No. 675,138
Int. Cl.[4] B30B 9/32
U.S. Cl. 100—215 3 Claims



1. Apparatus for crushing containers comprising
a tray for receiving a container to be crushed,
a crushing unit,
means for positioning said tray in a container presenting disposition adjacent said crushing unit,
means for transferring said container from said tray to said crushing unit, said crushing unit including a base platen receptive of a transferred container, and a crushing platen moveable in a downward direction from a first retracted position above said base platen to a second lowered position during which movement said upper platen crushes said container, said crushing unit including a housing having a top and a bottom and said base platen is slidable from a position wherein it is disposed at the bottom of said

housing to a location remote from said housing, said housing including a side wall having a lower edge closely conforming with the surface shape of said base platen whereby during sliding travel of said base platen to said remote location said housing side wall lower edge will effect sweeping of crushed container debris from the surface of said base platen.

4,599,942

COLD MARKING TYPESETTING STICK CARTRIDGE STAMPING TOOL

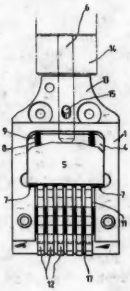
Ermano Bo, Ternay, France, assignor to Societe B.B.M. S.A., Feyzin, France

Filed Apr. 10, 1980, Ser. No. 139,026

Claims priority, application France, May 18, 1979, 79 13540

Int. Cl.[4] B41J *1/48*

U.S. Cl. 101—18 **14 Claims**



1. A stamping tool used for cold-marking a surface by stamping which comprises:

(a) a container;

(b) a plurality of marking elements for stamping characters on said surface, each of said marking elements comprising a rotatable wheel mounted to rotate independently in order to change the characters to be stamped by said wheels, means for mounting said marking elements without a common axle in said container in order to permit both independent rotation and independent vertical movement of said wheels, said wheels extending beyond said container in a lateral direction to permit adjustment of said wheels and downwardly below said container to facilitate marking; and

(c) a plunger supported on said marking elements, said plunger being adapted to be hit by a piston and said marking elements being adapted to be hit by said plunger.

4,599,943

ELECTROSTATIC-CHARGE-AND CHEMICAL-ATTACK-RESISTANT PRINTING CYLINDER CONSTRUCTION

Ingo Köbler, Anhausen, Fed. Rep. of Germany, assignor to M.A.N. - Roland Druckmaschinen Aktiengesellschaft, Offenbach, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,186

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1984, 3401350

Int. Cl.[4] B41F *7/02, 1/28, 29/02*

U.S. Cl. 101—217 **4 Claims**

1. An electrostatic-degradation-resistant rubber blanket cylinder-rubber blanket combination for an offset rotary printing machine comprising

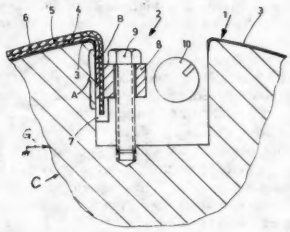
at least one rubber blanket cylinder (C);

an aggressive-chemical-resistant but electrostatically vulnerable coating layer (3) on said at least one rubber blanket cylinder (C), said rubber blanket cylinder (C) being formed with an axially extending groove (2) to receive end portions of the rubber blanket (5), said groove having opposed side walls, said layer covering only a portion of the side walls of said groove;

means (8, 9, 10) for stretching the rubber blanket (5) about the circumference of the cylinder and for clamping the blanket in position;

an underlay or pad (4) having an underlay end portion (B) of electrically poorly conductive material interposed between the rubber blanket (5) and said electrically poorly conductive surface layer (3);

means for protecting said aggressive-chemical-resistant but



electrostatically vulnerable coating layer (3) from electrostatic charge, said means including an electrical highly conductive layer (6) applied to that surface of the underlay or pad (4) which contacts the poorly conductive surface layer (3) of the cylinder (C), said electrically conductive layer (6) being electrically connected to ground or chassis (G);

said rubber blanket stretching and clamping means being arranged to clamp said underlay end portion (B) of said underlay or pad (4) to a side wall of said groove (2) in said cylinder (C) with said highly conductive layer (6), of said underlay or pad (4), against said side wall to electrically ground said highly conductive layer (6).

4,599,944

WRAP-ON PRINTING PLATE STRUCTURES AND ASSEMBLIES

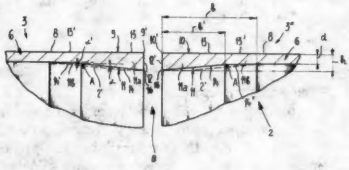
Max Dätwyler, Langenthal, Switzerland, assignor to MDC Max Dätwyler Bleienbach AG, Bleienbach, Switzerland

Filed Apr. 16, 1984, Ser. No. 600,365

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314083

Int. Cl.[4] B41F *27/06*

U.S. Cl. 101—378 **9 Claims**



1. A printing plate assembly, comprising in combination:

a rotary printing form cylinder;

a first flexible wrap-on printing plate structure having a first flexible printing plate body extending between opposite first and second edges of said first printing plate structure and being attached to said rotary printing form cylinder along said first and second edges of said first printing plate structure;

a second flexible wrap-on printing plate structure having a

second flexible printing plate body extending between opposite first and second edges of said second printing plate structure and being attached to said rotary printing form cylinder along said first and second edges of said second printing plate structure and abutting along a third edge of said second printing plate structure a third edge of said first printing plate structure extending between said first and second edges of said first printing plate structure;

means extending along said third edge of said first printing plate structure and abutting said form cylinder for mechanically stiffening said first printing plate structure along said third edge of the first printing plate structure including a first thickening of said first printing plate structure along said third edge of the first printing plate structure having a first lateral abutment surface of a height greater than a thickness of said first printing plate body; and

means extending along said third edge of said second printing plate structure and abutting said form cylinder for mechanically stiffening said second printing plate structure along said third edge of the second printing plate structure including a second thickening of said second printing plate structure along said third edge of the second printing plate structure having a second lateral abutment surfaces abutting said first lateral abutment surface and having a height greater than a thickness of said second printing plate body.

4,599,945

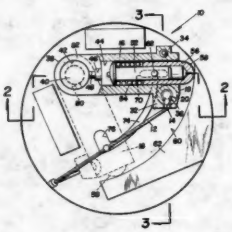
OUT-OF-LINE INTERRUPTER IGNITION SYSTEM FOR FLARES AND MARKERS

Edward P. Groustra, Ogden, and Henry J. Roberts, Roy, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Oct. 29, 1984, Ser. No. 665,863

Int. Cl.[4] **F42C** *15/18, 15/34*

U.S. Cl. 102—256 **6 Claims**



1. An ignition system for flares comprising:

a lower plate,

an upper plate, said upper plate being substantially parallel to said lower plate,

a primer charge,

a firing pin,

a helical spring,

a cup-shaped cam member,

a hollow pivot pin extending between and fixed in position between said upper and lower plates, said pivot pin containing boron pellets therein for igniting a flare and having an opening in the side thereof exposing said pellets,

an elongated firing pin housing having a first end and a second end with means at the first end for the attachment of a lanyard and being pivoted at said second end on said pivot pin, said housing having a plurality of bores of successively reduced size formed therein with the bore of largest size extending inwardly from said first end of said housing and the bore of smallest size being in communication with said pivot pin, said housing being adapted to be rotated around said pivot pin from an out-of-line position in which said bore of smallest size is angularly displaced from the opening in the side of the hollow pivot pin to an in-line position in which said bore of smallest size is aligned with the opening in the side of the hollow pivot pin,

said primer charge being located in an intermediate one said bores,

said firing pin being located in an innermost position in said bore of largest size and said cup-shaped cam member being located in an outermost position in said bore of largest size, said helical spring being positioned between and in engagement with both said firing pin and said cup-shaped cam member,

a cam surface, said cup-shaped cam member having a cam rider at the outer end thereof in engagement with said cam surface, said cam surface being so shaped that as said housing is rotated about said pivot pin said cam member is moved inwardly of the largest bore in the housing and compresses said helical spring thereby to produce a force tending to impel said firing pin toward said priming charge; and

means to prevent the firing pin from being impelled toward the priming charge until said bore of smallest size in said housing is in substantial alignment with the opening in the side of the hollow pivot pin exposing the boron pellets therein.

4,599,946

IGNITION DEVICE

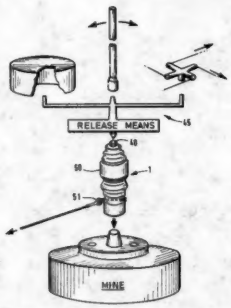
Willi Luebbers, Trittau, Fed. Rep. of Germany, assignor to Nico-Pyrotechnik Hanns-Juergen Diederichs GmbH & Co., KG., Trittau, Fed. Rep. of Germany

Filed Jan. 12, 1984, Ser. No. 570,217

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300748

Int. Cl.[4] **F42C** *1/02, 7/00;* **F42B** *23/26*

U.S. Cl. 102—274 **4 Claims**



1. Ignition device for mines, in particular training mines, comprising

a cylindrical housing having a central axis,

said housing having an inside surface with stop defined on said inside surface;

a percussion bolt;

an actuating lever,

said actuating lever and said percussion bolt disposed successively along said central axis inside said housing;

percussion bolt mounting means formed by clamp arms having an upper section and a lower section, said mounting means define a bore disposed along said central axis,

said mounting means commonly surrounding at least part of the axial extent of said percussion bolt and said actuating lever;

a cover for said housing, said cover defining a bore along said central axis,

said upper section of said clamp arms is fixed by said cover

and cooperating with said stop so as to prevent movement in an axial direction and in an outward radial direction;

biasing means,

said biasing means acting radially inwardly to press together said lower section of said clamp arms, thereby forming in said upper section of said clamp arms a swivel point relative between said clamp arms and said actuating lever;

said bore of said precussion bolt mounting means includes a first portion,

said first portion being rotation-symmetrical in a horizontal plane, and conically tapered upwardly and downardly in a vertical direction;

a second portion of said bore of said percussion bolt mounting means adjoins said first portion of said bore of said percussion bolt mounting means,

said second portion displays a cornered horizontal cross-section;

a third portion of said bore of said percussion bolt mounting means adjoins said second portion of said bore of said percussion bolt mounting means,

said third portion being cylindrical;

said actuating lever includes a first portion,

said first portion of said actuating lever is shape-adapted to said first portion of said bore of said percussion bolt mounting means;

a cornered portion of said actuating lever adjoins said first portion of said actuating lever,

said cornered portion is shape-adapted to said second portion of said bore of said percussion bolt mounting means; and

a third portion of said actuating lever adjoins said cornered portion of said actuating lever,

said third portion of said actuating lever is cylindrical and displays a diameter smaller than the diameter of said third portion of said bore of said percussion bolt mounting means.

4,599,947

RAILROAD CAR DIAPHRAGM

Ray A. Keefer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 533,394, Sep. 19, 1983, abandoned. This application Sep. 30, 1985, Ser. No. 772,086

Int. Cl.[4] B61D *17/22*

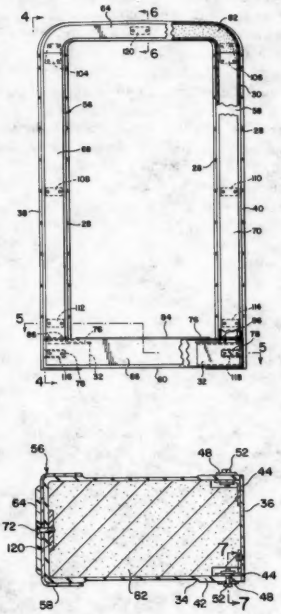
U.S. Cl. 105—15 **5 Claims**

1. A diaphragm for a railroad car comprising,

a mounting plate secured to the end face of a railroad car, a plurality of flexible diaphragm sections in continuous alignment attached to said mounting plate, each of said flexible diaphragm sections being U-shaped in configuration with two side portions and a bridging portion, flange and retainer plates connecting said side portions to said mounting plate,

a face plate exterior of said mounting plate secured to said bridging portion of said flexible diaphragm,

a resilient sponge means located within said flexible diaphragm between said mounting plate and said face plate along the upper portion of said diaphragm for providing resilience to said diaphragm, said face plate is constructed of separable sections for access to said diaphragm sections, shear mounts of rubber coupling the lower portion of the face plate to said railroad car, and



a wear plate covering the face of the face plate for contact with the adjacent car.

4,599,948

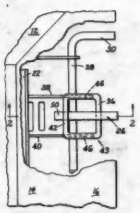
RAILWAY HOPPER GATE LOCKING ASSEMBLY

Robert W. Randolph, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,712

Int. Cl.[4] B61D *7/14, 7/20, 7/26*

U.S. Cl. 105—282 P **7 Claims**



1. A gravity outlet locking assembly comprising: a locking member integrally connected to a transversely extending operating shaft; a locking lug and a tripping element integrally connected to a movable gravity gate; said locking member having a hook portion which in closed position engages said locking lug; said locking member being movable to a generally vertical position by rotation of the operating shaft; means for moving said gate between open and closed positions; whereby as said gate is moved toward open position said tripping element engages said locking member and pivots the locking

member to a generally horizontal position; said locking member including a depending safety tip which is located below a fixed stop located adjacent the outlet wall; said safety tip extending outwardly from said shaft a greater distance than said shaft extends above the gate; whereby when the gate is in open position said locking member is restricted to movement between said gate and said fixed stop; and whereby as the gate is closed the locking lug rotates the hook portion of the locking member until the locking member drops into locked position engaging the locking lug.

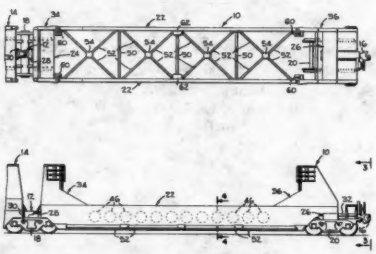
6. A gravity outlet locking assembly comprising: a locking member integrally connected to a transversely extending operating shaft; handle means located on at least one end of said shaft; an integral locking lug and a tripping element connected to a movable gravity gate; said locking member having a hook portion which in closed position engages said locking lug; said locking member being movable to a generally vertical position by rotation of the operating shaft; means for moving said gate between open and closed positions; whereby as said gate is moved toward open position said tripping element enages said locking member and pivots the locking member to a generally horizontal position; said locking member including a depending safety tip which is located below a fixed stop located adjacent the outlet wall; said safety tip extending outwardly from aid shaft a greater distance than said shaft extends above the gate; whereby when the gate is in open position said locking member is restricted to movement between said gate and said fixed stop; and whereby as the gate is closed the locking lug rotates the hook portion of the locking member until the locking member drops into locked position engaging the locking lug.

4,599,949

LIGHT WEIGHT CONTAINER CAR

Charles C. Hill, Del Mar, Calif., assignor to Gunderson, Inc., Portland, Oreg.

Filed Feb. 25, 1985, Ser. No. 704,435
Int. Cl.[4] B61D *3/20*; B61F *1/08*
U.S. Cl. 105—355 **5 Claims**



1. An improved body for a light weight railway car having side sills connected to body bolsters pivotally supported on trucks and adapted to support at least one container having a lower portion projecting downwardly between the side sills and body bolsters, the improvement in each side sill and body bolster comprising:

an outer plate of each side sill being formed from thin metal;

a plurality of spaced tubes welded to said outer plate and projecting inwardly therefrom;

means defining a channel having a plurality of portions removed therefrom defining openings therein spaced a distance apart equal to the spacing of said tubes and having said tubes welded adjacent the periphery of said openings, said portions removed from said channel having a weight substantially equal to the weight of said tubes for reducing the weight of said railway car and for improving the anti-buckling strength of said side sills;

each body bolster including a stub-center sill;

a pair of floor plates welded to said stub-center sill and projecting outwardly in opposite directions therefrom;

a pair of upright side walls welded to the ends of said floor plates;

a plurality of spaced upstanding baffles welded to said floor plates and each having a large weight reducing opening therein;

first and second upstanding walls and a top wall welded to each other and to said end walls, said baffles and said floor plates providing a rigid, light weight box body bolster;

a pair of gusseted V-shaped side bearing support members welded to one of said upstanding walls in alignment with associated baffles near the end portions of said body bolster;

a pair of angle brackets welded between the stub-center sill and the associated bottom plate to minimize bending of the bolster relative to its stub-center sill; and

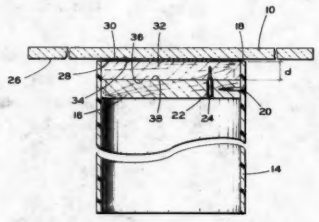
means for rigidly connecting associated ends of said side sills to associated ends of said bolsters.

4,599,950

ARTICLE OF FURNITURE AND METHOD OF MAKING SAME

Paul R. Evans, New Hope, Pa., assignor to Design Institute America, Inc., Montpelier, Ohio

Filed Jan. 28, 1985, Ser. No. 695,613
Int. Cl.[4] A47B *13/12*
U.S. Cl. 108—150 **11 Claims**



1. An article of furniture comprising:

a supporting base member having one portion in contact with a supporting surface and an oppositely spaced apart portion with an outwardly facing surface;

a glass member having at least two spaced apart substantially parallel surfaces;

a layer of glass enamel fused to a portion of at least one of the surfaces of said glass member; and

an adhesive layer interposed in intimate contact between the outwardly facing surface of said base member and said layer of glass enamel to compatibly adhere said glass member to said supporting base member.

4,599,951

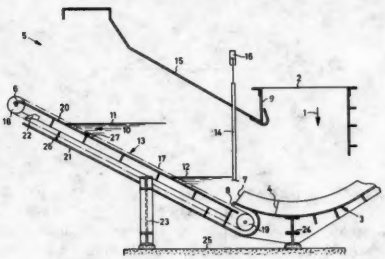
APPARATUS FOR DISCHARGING INCINERATION RESIDUES FROM FURNACES, PARTICULARLY REFUSE INCINERATORS

Brüno Andreoli, Uerikon, Switzerland, assignor to Von Roll AG., Gerlafingen, Switzerland

Filed Sep. 5, 1985, Ser. No. 772,896
Claims priority, application Switzerland, Sep. 12, 1984, 4359/84
Int. Cl.[4] F23J *1/02*
U.S. Cl. 110—171 **5 Claims**

1. An apparatus for discharging incineration residues from furnaces, particularly refuse incinerators, having a water-fillable trough to which the incineration residues are supplied by means of a drop shaft comprising a discharge chute having an upper wall wherein the chute adjoins the trough at a transition point wherein the chute slopes upwards from the trough and

has at its upper end an overflow edge, a reciprocatible piston for moving the incineration residues from the trough to a circulating device positioned in the discharge chute, said circulating device being in the form of a conveyor means for moving the incineration residues through the discharge chute to the overflow edge wherein means for separating the chute from the trough is provided above the transition point between the trough and the chute.



4,599,952

COMBUSTION CHAMBER

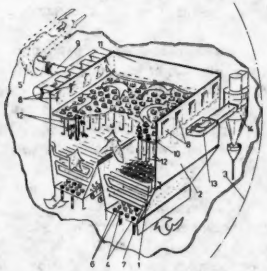
Hans-Joachim Meier, Wesel, Fed. Rep. of Germany, assignor to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,651

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409106

Int. Cl.[4] F23J 3/00

U.S. Cl. 110—216 3 Claims



1. Combustion chamber for the combustion of solid fuels, particularly under increased pressure, comprising: dust removal means; a gas outlet arranged at an upper end of the combustion chamber and adjoined by said dust removal means; said dust removal means comprising a plurality of tubular ceramic filter elements open at one side and suspended at a plate arranged before said gas outlet and forming the ceiling of the combustion chamber; a closable duct connected with a dust separator, said closable duct being connected to said combustion chamber underneath said plate.

4,599,953

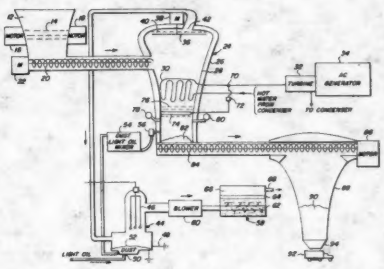
GARBAGE TO HYDROCARBON FUEL CONVERSION SYSTEM

William A. Gould, 486 - 14th St., Brooklyn, N.Y. 11215

Filed Jul. 8, 1985, Ser. No. 752,773

Int. Cl.[4] F23B 7/00

U.S. Cl. 110—234 2 Claims



1. Garbage to hydrocarbon fuel conversion system, comprising in combination:

(a) a source of combustible garbage;

(b) means for pulverizing said garbage;

(c) a furnace to burn said garbage;

(d) means for transporting said pulverized garbage to said furnace which comprises a motor operated worm feed automatic stoker;

(e) a steam generating coil inside said furnace which supplies live steam to power a turbine which in turn powers an alternating current generator; and a condenser which returns remaining said steam to a liquid state for re-circulation through said steam generating coils;

(f) means for collecting incompletely combusted waste gases from said furnace; precipitating out dust and light oil for re-combustion in said furnace; and, extracting hydrocarbon gas; where in said means for precipitating out dust and light oil for re-combustion in said furnace comprise a cottrell precipitator wherein oil from an external source is mixed with fine dust received from said exhaust port, wherein an electrostatic charge helps to precipitate said dust; a dust and light oil mixer which provides a homogeneous mixture; and, an oil burner mounted to said furnace whose heat output is supplied to said furnace to add energy thereto; and,

(g) means for burning trapped heavy gases and removing waste ash from said furnace for disposal.

4,599,954

SEWAGE SLUDGE DISPOSAL PROCESS AND APPARATUS THEREFOR

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

Filed Feb. 22, 1985, Ser. No. 705,308

Int. Cl.[4] F23G 7/04

U.S. Cl. 110—346 5 Claims

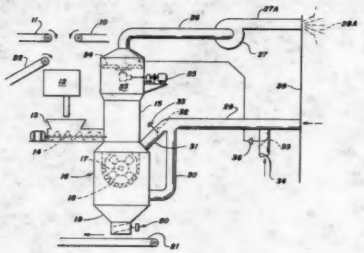
1. A process for inhibiting the formation of surface coating of sewage sludge in apparatus for disposing of wet sewage sludge which comprises the steps of:

(a) bringing wet sewage sludge and a solid grindable particulate material together to form a mixture;

(b) feeding the thus formed mixture into grinding apparatus and relying on the particulate material to inhibit the sewage sludge forming a coating in the grinding apparatus;

(c) supplying a hot gaseous medium to the mixture of the

sewage sludge and particulate material during the grinding thereof for drying the same; and



(d) reintroducing a portion of the ground mixture of sewage sludge and particulate material to the grinding apparatus for imparting its drying heat to the feeding of the mixture.

4,599,955

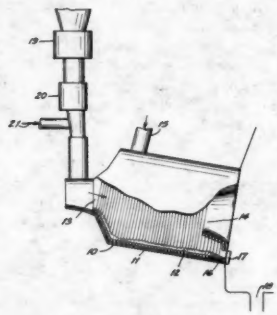
COAL SLAGGING BURNER FOR PRODUCING CLEAN LOW-SULFUR FUEL GAS

Malcolm T. Hepworth, Golden, and Gordon R. Wicker, Lakewood, both of Colo., assignors to AMAX Inc., Greenwich, Conn.

Continuation of Ser. No. 664,269, Oct. 24, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,860

Int. Cl.[4] F23D 1/00

U.S. Cl. 110—347 **5 Claims**



1. The process for combusting coal containing about 2% to 8% sulfur by weight to release and recover the heat content thereof while producing a low-sulfur off-gas which comprises:

combusting finely divided coal in a slagging cyclone burner under conditions of incomplete combustion to convert the sulfur content of said coal to hydrogen sulfide,

carrying out said incomplete combustion within the interior wall of said burner in the presence of a basic compound selected from the group consisting of lime, limestone and dolomite premixed in powdered form with said coal in an amount proportioned to the silica content of said coal to produce a fluid slag in said burner and producing a combustion-product gas rich in combustibles but of reduced sulfur content,

introducing said coal and the basic compound axially into said burner with primary air, while introducing preheated secondary air tangentially into said burner to maintain a combustion temperture of at least about 1200° C. in said burner,

the interior wall of said burner being coated with said fluid slag which reacts with the sulfur compounds in the gas phase, the slag also containing carbon particles from the incomplete combustion of said coal which react with oxidizing constituents in the combustion-product gas, completely combusting the combustion-product gas and removing said molten slag containing most of the sulfur initially present in said coal.

4,599,956

BORER APPARATUS FOR AN EMBROIDERING MACHINE

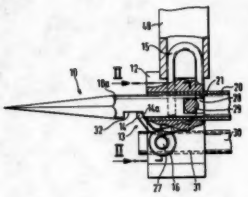
Armin Kobler, Arbon, and Peter Josuran, Goldach, both of Switzerland, assignors to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland

Filed Nov. 12, 1985, Ser. No. 797,387

Claims priority, application Switzerland, Nov. 22, 1984, 5583/84

Int. Cl.[4] D05C 7/04

U.S. Cl. 112—89 **9 Claims**



1. A borer apparatus for an embroidering machine, comprising:

a borer support member;

at least one exchangeable borer implement releasably and exchangeably mountable in said borer support member and secured against rotation in relation thereto;

said at least one exchangeable borer implement having a shaft and a longitudinal axis;

said borer support member being provided with at least one bore for each said at least one exchangeable borer implement;

said shaft of each said at least one exchangeable borer implement engaging said at least one bore with a close fit;

said shaft being provided with a recess and an end slot;

a first stop member protruding transversely into at least one bore and engaging said recess of said shaft for securing said shaft against rotation relative to said borer support member;

said first stop member protruding into said at least one bore comprising a first pin member;

said first pin member penetrating said borer support member and said end slot of said shaft;

said first pin member having a free end;

outwardly pivotably journalled spring means for axially securing said at least one exchangeable borer implement;

said spring means having a free end;

said free end of said first pin member protruding from said borer support member for forming a biasing stop for said free end of said spring means;

said spring means having a clamping shank;

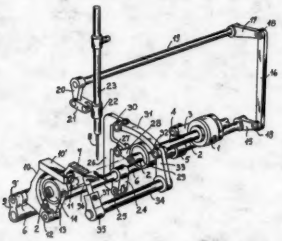
said recess of said shaft having a contact surface extending substantially perpendicular to said longitudinal axis of said at least one exchangeable borer implement; and

said clamping shank of said spring means engaging said contact surface.

4,599,957
LOOPER ACTUATING DEVICE FOR SEWING MACHINES

Ulderico Marcandalli, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Continuation of Ser. No. 450,940, Dec. 20, 1982, abandoned. This application Jul. 18, 1985, Ser. No. 756,175
Claims priority, application Italy, Apr. 21, 1982, 20860 A/82
Int. Cl.[4] D05B 1/06, 57/04
U.S. Cl. 112—199 2 Claims



1. An operating device for a forward moving looper in sewing machines of the type having workpiece transport movements performed simultaneously by a needle and feed dog, said operating device comprising:

a rotatably driven shaft mounted in the machine including: a selectively variable eccentric mounted on and for rotation therewith;

a drive shaft spaced from and extending parallel with said rotatably driven shaft having opposite ends thereof operatively connected to said needle and feed dog respectively;

first drive means interconnecting said eccentric with said drive shaft for effecting simultaneous transport movements of said needle and feed dog of varying amplitude depending on the position of said eccentric; and

second drive means mounted on said driven shaft for oscillating the looper along a basic path of constant amplitude and means operatively connecting said drive shaft with the looper and effective to modify said basic path so that oscillations of the looper are initiated at constant distance from the withdrawn trajectory of the needle, whose inclination from the vertical depends on the amount of the stitch length.

4,599,958
METHOD AND APPARATUS FOR MAKING PLEATED DRAPERIES OF ARBITRARY LENGTHS

Joseph D. Stiers, Phoenix, Ariz., assignor to Multiple-Housing Drapery Services, Inc., Phoenix, Ariz.

Filed Mar. 15, 1985, Ser. No. 712,154
Int. Cl.[4] D05B 97/00, 35/08; A41H 43/00
U.S. Cl. 112—262.1 15 Claims

1. A method of making French pleated draperies, said method comprising the steps of:

(a) sewing edges of a plurality of rectangular panels of fabric together to form a relatively wide section of drapery material;

(b) sewing a bottom hem on the section of drapery material;

(c) attaching a strip of buckram material along a top edge of the section of drapery material;

(d) positioning the top edge and the bottom edge of the section of drapery material under first and second marking guide members, respectively, each of said first and second marking guide members having a plurality of parallel elongated guide slots with center to center spacing equal to distance between desired pleat center marks on the section of drapery material;

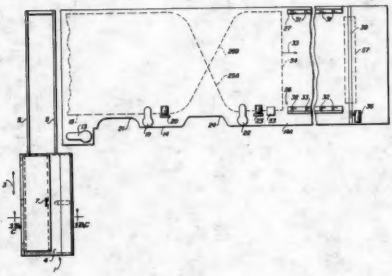
(e) guiding a tip of a marker through each of the guide slots in the first and second marking guide members against the section of drapery material and guiding the tip of the marker along the length of each guide slot to form pleat center marks and fold marks along the top and bottom edges, respectively, of the section of drapery material, the marker forming marks that are invisible in ordinary light but visible when illuminated by ultraviolet light;

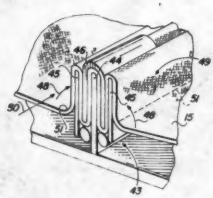
(f) cutting a subsection of fabric of a desired width from the section of drapery material;

(g) sewing side hems on the subsection of fabric;

(h) forming each of a plurality of French pleats along the top edge of the subsection by illuminating the top edge of the subsection with ultraviolet light to make a pleat center mark visible and aligning that pleat center mark with a center blade of a pleat forming machine, operating the pleat forming machine to pre-form that pleat, removing the preformed pleat from the pleat forming machine, and operating an L-tacking machine to stitch that pleat; and

(i) by illuminating the bottom edge of the drapery formed from the subsection with ultraviolet light to make the fan folding marks visible, fan folding the bottom edge of that drapery at each of the illuminated fan fold marks, and essentially simultaneously fan folding the top edge of that drapery at each of the French pleats.





14. An apparatus for making French pleated draperies, said apparatus comprising the steps of:

(a) means for sewing edges of a plurality of rectangular panels of fabric together to form a relatively wide section of drapery material;

(b) means for sewing a bottom hem on the section of drapery material;

(c) means for attaching a strip of buckram material along a top edge of the section of drapery material;

(d) means for positioning the top edge and the bottom edge of the section of drapery material under first and second marking guide members, respectively, each of said first and second marking guide members having a plurality of parallel elongated guide slots with center to center spacing equal to distance between desired pleat center marks on the section of drapery material;

(e) means for guiding a tip of a marker through each of the guide slots in the first and second marking guide members against the section of drapery material and guiding the tip of the marker along the length of each guide slot to form pleat

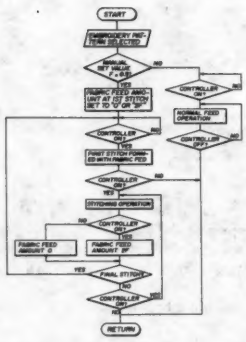
center marks, and fan folding marks along the top and bottom edges, respectively, of the section of drapery material, the marker forming marks that are invisible in ordinary light but visible when illuminated by ultraviolet light;
(f) means for cutting a subsection of fabric of a desired width from the section of drapery material;
(g) means for sewing side hems on the subsection of fabric;
(h) means for forming each of a plurality of French pleats along the top edge of the subsection by illuminating the top edge of the subsection with ultraviolet light to make a pleat center mark visible and aligning that pleat center mark with a center blade of a pleat forming machine;
(i) an L-tacking machine to stitch that pleat; and
(j) means for illuminating the bottom edge of the drapery formed from the subsection with ultraviolet light to make the fan folding marks visible to allow fan folding the bottom edge of that drapery at each of the illuminated fan folding marks.

4,599,959

METHOD OF PRODUCING PATTERNS OF ZIGZAG STITCHES

Yasuro Sano, and Eiji Murakami, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Feb. 22, 1985, Ser. No. 704,112
Claims priority, application Japan, Feb. 22, 1984, 59-30410
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—266.1 **3 Claims**



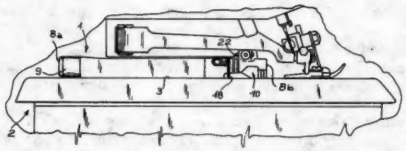
1. A method of producing patterns of zigzag stitches on a fabric with a sewing machine having an electronic memory storing stitch control information for said patterns, said stitch control information including data for controlling a pulse motor which is steppingly operated on a basis of a minimum angular step to control a position of a needle with respect to the fabric and data for controlling a second pulse motor which is steppingly operated on a basis of a minimum angular step to control a fabric feeding amount with respect to the needle, said needle position control data and said fabric feeding amount control data being selectively and sequentially read out from the electronic memory to control formation of the patterns, said method comprising the steps of:
selecting one of said patterns composed of densely arranged zigzag stitches each accompanied by a fabric feeding amount predetermined by said minimum angular step of said feed control pulse motor;
selecting an adjustment of said predetermined fabric feeding amount of said selected pattern;
selecting a digital value required for said adjustment of said predetermined fabric feeding amount of said selected pattern to a value not exceeding a predetermined critical value; and
programming a calculator to make a calculation doubling said selected digital value to thereby control said second pulse motor with said calculated value, and to drive said second pulse motor each time an alternate stitch has been formed.

4,599,960

SEWING MACHINE THREAD CHAIN CUTTER

Gianfranco Brussasca, Milan, and Franco Garzulano, Novara, both of Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Apr. 19, 1985, Ser. No. 725,072
Claims priority, application Italy, Nov. 9, 1984, 23740/84[U]
Int. Cl.[4] D05B *65/06*
U.S. Cl. 112—287 **4 Claims**



1. A thread-cutting device for a sewing machine, of the type comprising: a rigid casing fixed on one edge of the working surface of the sewing machine in a position adjacent to the fabric being sewn, a discharge tube extending from one end of said casing to a suction mouth located on the other end of said casing and facing the fabric being sewn, a compressed air feed pipe, comprising at least one vent located in the said mouth and designed to direct said compressed air along the said discharge tube, and a pivotable cutting element mounted in the region of the said suction mouth, said casing having a control element fixed to it which is provided with a rod-shaped portion passing across the said suction mouth and means for positioning said rod-shaped portion in a plurality of reference notches located on the outside of the said casing, the said reference notches being arranged in accordance with the types of fabric which can be sewn and being designed to position the said rod-shaped portion in a direction substantially perpendicular to the feed direction of the fabric being sewn.

4,599,961

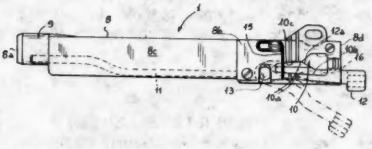
SEWING MACHINE THREAD CHAIN CUTTER

Gianfranco Brussasca, Cornaredo, and Franco Garzulano, Gallia te, both of Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Jun. 17, 1985, Ser. No. 745,457
Claims priority, application Italy, Nov. 9, 1984, 23739/84[U]
Int. Cl.[4] D05B *65/06*
U.S. Cl. 112—287 **4 Claims**

1. A thread chain cutter for sewing machines of the type comprising stationary and movable cutting means and a casing fixed on one edge of the working surface of the machine in a position adjacent to the fabric being sewn, in which provision is made for a discharge tube provided with a suction mouth oriented towards the said fabric, and further comprising a tube producing compressed air and terminating with at least a vent hole disposed inside said discharge tube in a rearward position with respect to said suction mouth and oriented towards a rear

portion of said discharge tube in order to produce a Venturi effect and therefore a suction action on the thread chain passing before said suction mouth, a movable blade operations in said suction mouth and being part of said movable cutting means for said thread chain to be cut, said movable blade being hinged on said casing inside said discharge tube, wherein said movable blade mainly extends in a substantially straight line and wherein said movable blade, when in its position of maximum closure on said suction mouth, completely closes a first



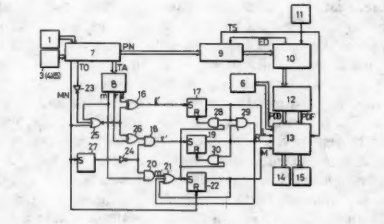
zone of said suction mouth, which zone the upper edge of which defines the stationary cutting means extends like a substantially horizontal slot parallel to the direction in which the fabric being sewn is fed, and partially blocks a second wide zone which widens out starting from the lower edge of said first zone towards the fornt end of said casing and in an upward direction so that it extends higher than the upper edge of said first zone in order to suck in the fine dust particles in the region of said thread chain cutter.

4,599,962

ELECTRONIC SEWING MACHINE

Takeshi Kongoh, and Haruhiko Tanaka, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,689
Claims priority, application Japan, Apr. 30, 1983, 58-74928
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—454 **10 Claims**



1. In an electronic sewing machine having stitching means including a needle swingable laterally of a fabric feeding direction in an amplitude extending between a left position, through a middle position, to a right position and vertically reciprocated to penetrate a fabric to be sewn to make stitches, a fabric feeding device operated in a timed relation with the needle to transport the fabric relative to the needle, and actuating means coupled to the stitching means for operating the needle and fabric feeding device, a stitch control means comprising:

first means for storing a plurality of available stitch patterns;

second means for storing a base line for each stored stitch pattern, the swinging amplitude of the needle being referenced to the base line associated with each stitch pattern, each stored base line corresponding to one of said left, middle and right positions;

means coupled to said first and second means to select a desired stitch pattern and its associated base line;

third means coupled to said first means for storing a plurality of selected stitch patterns for stitching said selected stitch patterns in sequence;

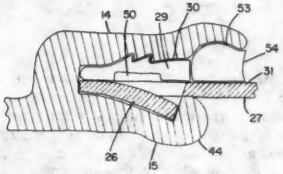
fourth means coupled to said second means for establishing one base line for every sequence of a plurality of selected stitch patterns including means for outputting to the actuating means only the middle base line whenever patterns having left and right base lines, respectively, are selected.

4,599,963

BOAT CONSTRUCTION

David E. Payne, Villa 133, Captain John Fripp's Villas, Fripp Island (Beaufort), S.C. 29901

Continuation-in-part of Ser. No. 356,371, Mar. 9, 1982, abandoned, and a continuation-in-part of Ser. No. 578,565, Feb. 9, 1984, Pat. No. 4,572,096. This application Sep. 5, 1984, Ser. No. 647,417
Int. Cl.[4] B63B *3/00*
U.S. Cl. 114—88 **47 Claims**



1. A method of construction a vessel, comprising the steps of:

a. producing a shaped joining strip having first and second facing surfaces defining a slot therebetween, the first surface having a tooth formation, the second surface having an abutment including an angles surface;

b. deforming a sheet of material near one edge thereof to provide a retaining surface projecting from one face of the sheet;

c. inserting the deformed edge of the sheet into the slot and locating the retaining surface adjacent the angled abutment surface;

d. providing a key having a tooth formation on one surface;

e. inserting the key into the slot to locate the tooth formation of the key and the strip in engaging relationship and also to bear against the other face of the sheet thereby providing engagement of the projection retaining surface and the angled abutment surface; and

f. clamping ends of the strip and portions of the sheet adjacent those ends with respective pairs of clamps by urging one of each pair into surface-to-surface engagement with inner surfaces of the strip and sheet and the other of each pair into surface-to-surface engagement with outer surfaces of the strip and sheet so as to thereby firmly close and clamp the strip ends against the sheet and the key.

4,599,964

SAILBOAT HULL

Thomas A. Kenney, 42 Beacon St., Hull, Mass. 02045, and Frederick W. Holbrow, 25 Congress St., Braintree, Mass. 02184

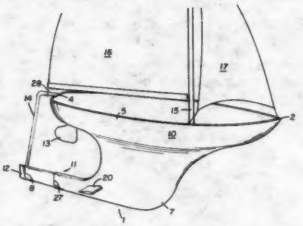
Filed Dec. 21, 1984, Ser. No. 685,243
Int. Cl.[4] B63B *39/02*
U.S. Cl. 114—124 **2 Claims**

1. A new and improved sail boat hull of the type having a bow and stern visible above the water line, a rudder below the water line, and a hull substantially beneath the water line, generally tapered so that a center portion of the hull protrudes

in fin-like fashion vertically downwards and which center portion contains ballast arranged so that the sailboat's center of gravity is approximately at the midpoint of the sailboat, the improvement comprising:

a lower hull extension having a general fin-like shape extending rearward of the visible stern, below the rudder, along a telescopically adjustable longitudinal axis parallel to the longitudinal axis of the sailboat;

a ballast arrangement in said lower hull extension whereby the center of gravity of the sailboat is moved from the sailboat's midpoint toward the stern;



a means for distributing ballast to correspond with the telescopic changes in the lower hull extension consisting in the ballast in the lower hull extension being so arranged and attached to the lower hull extension that telescopic fore and aft adjustment of the lower hull extension will correspondingly adjust ballast providing a resultant fore and aft adjustment of the sailboat's center of gravity;

a plurality of horizontal fins extending laterally from either side of the lower hull extension;

a vertical trim tab pivotally attached to the aft end of the lower hull extension; and

a plurality of tubes attached to the visible stern and extending aft and down to the aft end of the lower hull extension.

4,599,965

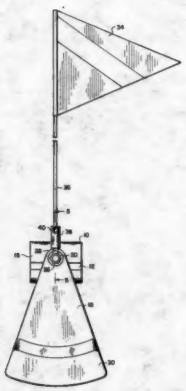
PIVOTALLY MOUNTED DIVER'S SIGNAL FLAG

Robert E. Johnson, 5175 Lehrer Dr., San Diego, Calif. 92117

Filed Dec. 10, 1984, Ser. No. 679,645

Int. Cl.⁴ G09F *17/00*

U.S. Cl. 116—209 **10 Claims**



9. A diver's safety flag having means for maintaining a vertical orientation of the flag during diving activity, comprising:

mounting means including loop means for receiving and encircling a belt for attachment to and positionable at the side of a diver, said mounting means including a normally horizontally extending shaft;

eccentric mass means having a generally pendulum configuration pivotally mounted on said shaft for freely pivoting about a normally horizontal axis, and including a normally vertically oriented socket formed in said mass means; and

an elongated mast detachably mounted in said socket in said eccentric mass means and biased by said eccentric mass means to a normally vertical position, whereby said mast remains vertical and projects above the water regardless of the attitude of a diver at or near the surface of the water.

4,599,966

SOLDER LEVELLER

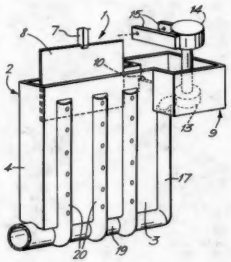
Peter A. P. Lymn, 64 Heath Rd., Petersfield, Hampshire, United Kingdom

Filed Dec. 19, 1984, Ser. No. 683,415

Claims priority, application United Kingdom, Dec. 22, 1983, 8334122

Int. Cl.⁴ B05C *3/10*

U.S. Cl. 118—63 **8 Claims**



1. A solder leveller comprising a solder bath, into which a board to be soldered is lowered, and means for levelling solder deposited on the board as it is withdrawn from the bath, wherein said bath comprises parallel spaced apart side walls, end walls and a bottom wall; and means for recirculating molten solder to and from said bath, said recirculating means comprising a plurality of side wall ducts extending upwardly (each positioned on said side walls and running up) from said bottom wall towards the top of said side walls and positioned on each of said side walls, said side wall ducts having side wall ports therein one above another to direct a flow of solder against opposite sides of a board inserted in the bath, an elongate bottom wall duct extending along said bottom wall of said bath, said elongate bottom wall duct having ports communicating with the lower ends of the side wallducts, and means for pumping soler through said elongate bottom wall duct, said side wall ducts and said bath.

4,599,967

VESSEL NOZZLE CLEANING APPARATUS AND METHODS

Arthur D. Murphy, Macclesfield, England, and Alan E. T. Grattidge, Aberdeen, Scotland, assignors to John M. Henderson and Company Limited, Aberdeen, Scotland

Filed Nov. 13, 1984, Ser. No. 670,317

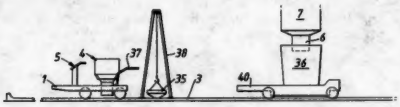
Claims priority, application United Kingdom, Nov. 22, 1983, 8331152

Int. Cl.⁴ B05C *11/00*

U.S. Cl. 118—72 **9 Claims**

1. Apparatus for cleaning or deskulling a downwardly protruding nozzle of a vacuum degassing vessel comprising a

rotatable tool carrier capable of being positioned below the degassing vessel; said tool carrier being open topped and having a base and sides, and having side scraping tools fixed about the sides and bottom scraping tools fixed at the base; means for



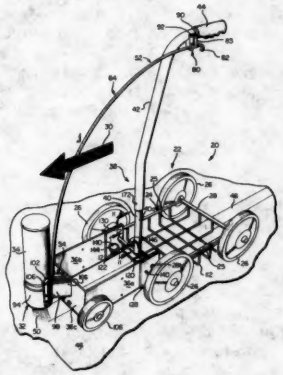
rotating the tool carrier; and means for lowering the vessel and/or raising the tool carrier whereby the nozzle enters the carrier so as to engage the sides of the nozzle with the side tools and then the bottom of the nozzle with the bottom tools.

4,599,968

COLLAPSIBLE PAINTING CART

Francis E. Ryder, and Fred E. Williams, Jr., both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed May 23, 1985, Ser. No. 737,816
Int. Cl.[4] B05B *13/00*
U.S. Cl. 118—305 **24 Claims**



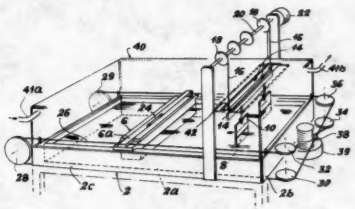
1. A collapsible painting cart apparatus comprising: a mobile frame; receptacle means for receiving a container of paint; an extendable and retractable mounting and guide member for mounting said receptacle means and for guiding the direction of paint released form the container received by said receptacle means, said mounting and guide member being mounted to said frame for movement between a first position extended from said frame for applying paint to a desired surface and a second position retracted within said frame for storage; and handle means attachable to said frame and extending upwardly therefrom for gripping by an operator to propel said mobile frame relative to said surface; wherein said mounting and guide member includes a pair of side walls and a front wall, and lid means for attaching the receptacle means to said front wall at varying heights, comprising, a pair of projections on said receptacle means and a plurality of pairs of apertures formed in said front wall and sized to receive said projections, such that said receptacle means can be mounted internally of said mounting and guide members between said side walls or exteriorly of said side walls.

4,599,969

DEVICE FOR THE FORMATION AND DEPOSITION ON A SUBSTRATE OF MONOMOLECULAR FILMS

André Barraud, Bures-sur-Yvette, and Jean Lelcuf, Gif sur Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1984, Ser. No. 677,012
Claims priority, application France, Dec. 9, 1983, 83 19770
Int. Cl.[4] B05C *3/00, 11/00, 19/02*
U.S. Cl. 118—429 **9 Claims**



1. A tank for the deposition of a monomolecular film comprising a tank having walls with a horizontal rim and a base, the tank containing a liquid, a barrier defining two areas on the surface of the liquid, means for displacing the barrier on the surface of the liquid in a direction perpendicular to the barrier, a solvent placed on the surface of the liquid and containing dissolved molecules, at least one substrate, means for displacing the substrate in a vertical direction and means for measuring the tension on the surface of the liquid, wherein the level of the liquid is below the horizontal rim of the tank, the barrier having a break at each of its ends and resting on the edges of the tank by said break, the break also defining a narrower portion which is partly submerged in the liquid of the tank, sealing means being provided between the faces of the narrower portion and the facing walls.

4,599,970

APPARATUS FOR COATING A SELECTED AREA OF THE SURFACE OF AN OBJECT

Frederick W. Peterson, East Hempsfield Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

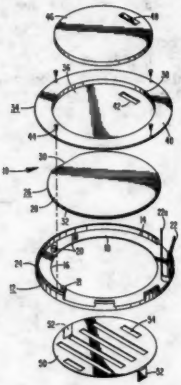
Filed Mar. 11, 1985, Ser. No. 710,275
Int. Cl.[4] B05C *11/16*
U.S. Cl. 118—504 **7 Claims**

1. Apparatus for coating a selected area of the surface of a body comprising

a support member having a recess in one side which is adapted to receive the body and an opening extending therethrough from the bottom of the recess to expose the surface of the body to be coated, said opening being smaller than the bottom of the recess,

means for securing the body against the bottom of the recess with the surface of the body exposed through the opening including a cover plate having a portion adapted to fit in the recess to engage the body and hold the body against the bottom of the recess and a rim extending over the surface of the support member around the recess and means for securing the cover plate to the support member,

a mask adapted to fit in the opening against said surface of the body, and



a magnet adapted to be seated on the securing means to hold the mask against the surface of the body.

4,599,971

VAPOR DEPOSITION FILM FORMING APPARATUS

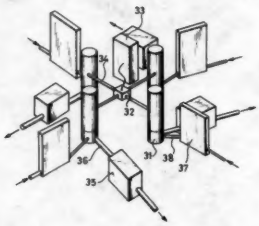
Yasutomo Fujiyama, and Shotaro Okabe, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 650,164, Sep. 13, 1984, abandoned. This application May 6, 1985, Ser. No. 731,334

Claims priority, application Japan, Sep. 14, 1983, 58-168378

Int. Cl.[4] C23C *13/08*

U.S. Cl. 118—723 **1 Claim**



1. A vapor deposition film forming apparatus comprising a plurality of reactors each having means for holding a substrate and an electrode arranged in a vacuum chamber and means for applying a voltage thereacross to react or decompose reaction gas introduced into said vacuum chamber,

wherein center axes of said reactors are arranged on the circumference of a circle and coaxial cables having substantially equal impedance radially extend to said reactors from a matching circuit located at the center of said circle.

4,599,972

PORTABLE FREE STALL

Winston S. Kilburn, R.D. 1 - Burt Rd., P.O. Box 1183, Gansevoort, N.Y. 12831

Filed Jul. 23, 1984, Ser. No. 633,626

Int. Cl.[4] A01K *1/00*

U.S. Cl. 119—27 **6 Claims**

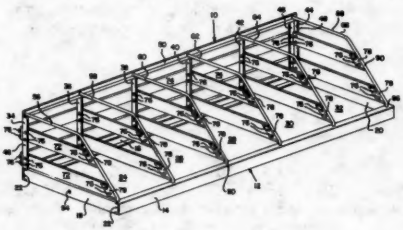
1. A portable free stall construction of unitary construction comprising

a free standing structural steel base frame, the base frame defining a polygon-shaped configuration and having longitudinally extending base members and transversely extending frame members,

the said base members and frame members being affixed together to enable the base frame to be moved as a unit;

a plurality of longitudinally spaced uprights secured to one of the longitudinally extending base members, said uprights subdividing the portable free stall into a plurality of individual stalls,

said uprights comprising longitudinally aligned portions and tranversely aligned portions, the longitudinally and transversely aligned portions being provided with means to attach planar barriers thereto;



a plurality of partition frames respectively extending rearwardly from said uprights to a transversely opposite portion of the base frame, each partition frame being secured respectively forwardly to an upright and respectively rearwardly to the transversely opposite portion of the base frame;

a plurality of longitudinally aligned planar barriers secured to the longitudinally aligned portions of the uprights at the said means to attach to define the forward extent of the free stall; and

a plurality of transversely aligned planar barriers secured to the transversely aligned portions of each of the uprights at the said means to attach and a portion of a partition frame,

whereby a plurality of individual stalls having closed fronts and open backs can be provided.

4,599,973

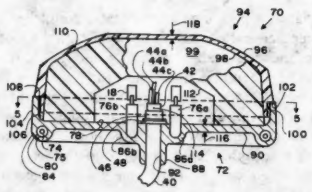
LIVESTOCK TANK WATER HEATER

Richard E. Ward, 11040 4A Rd., Plymouth, Ind. 46563

Filed Nov. 5, 1984, Ser. No. 667,986

Int. Cl.[4] H05B *3/78;* A01K *7/00*

U.S. Cl. 119—73 **19 Claims**



1. A water heater for seasonal insertion into a stock watering tank, which water heater comprises:

a first housing portion of molded aluminum;

a second housing portion;

means, comprising one of said housing portions, for providing a cavity;

an elongated electric heating element being molded into said first housing portion, and having first and second ends that extend from said first housing portion into said cavity;

a thermostatically controlled switch being disposed in said

cavity, being bonded to said first housing portion, having a first terminal that is electrically connected to said first end of said heating element, and having a second terminal;

access means, for inserting an electrical cable into said cavity;

a flexible electrical cable extending through said access means, having a first end that is disposed in said cavity, having a first conductor that is electrically connected to said second terminal, and having a second conductor that is electrically connected to said second end of said heating element; and

means for hermetically sealing said cavity.

4,599,974

COMBUSTION CHAMBER FOR A VAPOR GENERATOR

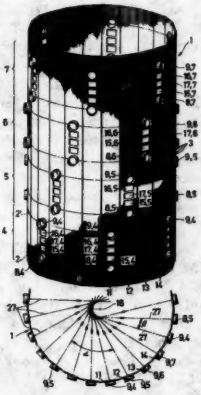
Karl Rees, Ruti, Switzerland, assignor to Sulzer Brothers Limited, Winterhur, Switzerland

Filed Aug. 15, 1984, Ser. No. 640,977

Claims priority, application Switzerland, Aug. 23, 1983, 4579/83

Int. Cl.[4] F22B *15/00*

U.S. Cl. 122—235 P 13 Claims



1. A combustion chamber for a vapor generator, said chamber comprising

a plurality of wall tubes welded together to form a gas tight wall and disposed in parallel to a longitudinal axis of the chamber for carrying a working medium therethrough;

at least three burner layers disposed along said longitudinal axis;

at least two burners disposed in each said burner layer, said burners being disposed in a common plane transverse to said longitudinal axis with each burner having a jet axis for a flame extending in a common direction tangentially to an imaginary circle concentric to said axis; and

each pair of adjacent burners in a respective layer having the jet axes thereof defining a first angle therebetween and said jet axes of said burners of each layer being offset from said jet axes of an adjacent layer over a second angle projected parallel to said longitudinal axis less than said first angle whereby said burners extend on a helix about said longitudinal axis.

4,599,975

CONTROL OF BOILER OPERATIONS

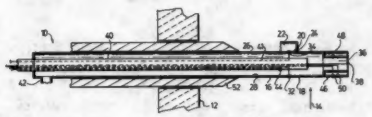
Douglas W. Reeve, and Hoc N. Tran, both of Toronto, Canada, assignors to 471199 Ontario Limited, Toronto, Canada

Filed Aug. 31, 1984, Ser. No. 646,016

Claims priority, application United Kingdom, Sep. 1, 1983, 8323409

Int. Cl.[4] F22B *37/18, 37/48*

U.S. Cl. 122—379 28 Claims



1. A deposit monitoring device for contact with a hot flowing gas stream, which comprises elongate probe arm means adapted to be located in contact with the gas stream to establish a windward and a leeward side of said probe arm means with respect to said flowing gas stream, first heat detection means associated with said windward side of the probe arm means for detection of heat reaching said windward side of said probe arm means from said gas stream, and second heat detection means associated with said leeward side of the probe arm means for detection of heat reaching said leeward side of said probe arm means from said gas stream.

4,599,976

RECIPROCATING ROTARY PISTON THERMAL ENGINE WITH A SPHERICAL CHAMBER

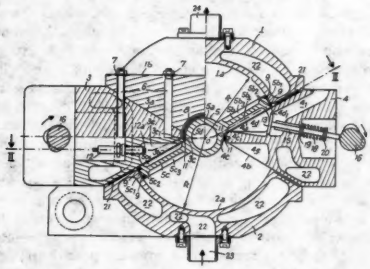
Paul V. Meuret, La Seyne-sur/Mer, France, assignor to Societe a Responsabilite Limitee Datome, La Seyne sur-Mer, France

Filed Nov. 30, 1984, Ser. No. 676,637

Claims priority, application France, Dec. 13, 1983, 83 20083

Int. Cl.[4] F02B *53/00*

U.S. Cl. 123—18 A 9 Claims



1. A thermal engine comprising a spherical chamber having a predetermined diameter within which moves a piston reciprocatingly rotatively thereto, said piston being mounted about a rotating shaft going through the center of said chamber, which chamber is sealed by a cylinder head, said engine further comprising external means for converting the reciprocating rotation of the piston into a continuous rotation, the piston has an overall shape of a semi-circular vane manolithic with said rotating shaft and extending orthogonally along the generatrices of the shaft, said piston having a slightly smaller radius than that of the spherical chamber so that it can move along and near an inside wall of said chamber, sealing being provided between the piston and the chamber wall in the form of at least one continuous sealing strip embedded in a groove in a periphery of the piston, said continuous sealing strip extends at both of its ends into a respective recess formed in said shaft at a junction where said periphery of said piston joins said shaft to

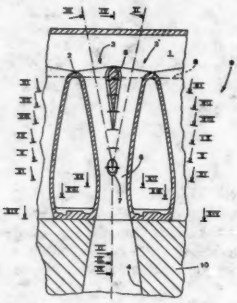
complete the seal between the piston and the chamber, the cylinder head extends along the diameter of the chamber and comprises on at least one side of said shaft and near thereto an edge parallel with said generatrices of the shaft with a sealing means between said shaft and said cylinder head being provided by at least one insert embedded in a groove along an entire length of said edge, said sealing insert has ends extending beyond the inside wall of the spherical chamber to complete the seal between said cylinder head and said shaft.

4,599,977

INLET MANIFOLD FOR NORMAL INDUCTION OR SUPERCHARGED INTERNAL COMBUSTION ENGINES FEATURING INDIRECT FUEL INJECTION

Nicola Materazzi, Maranello, Italy, assignor to Ferrari Societa' per Azioni Esercizio Fabbriche Automobili e Corse, Modena, Italy

Filed Jan. 2, 1985, Ser. No. 688,830
Claims priority, application Italy, Jan. 27, 1984, 40009 A/84
Int. Cl.[4] F02M *57/00*
U.S. Cl. 123—52 M **6 Claims**



1. An inlet manifold for supercharged internal combustion engines having indirect fuel injection, wherein each cylinder intake section comprises a chamber supplying supercharged air, an intake passage wherein fuel and air are mixed, and a final mixture inlet passage leading to a cylinder and located within a cylinder head, wherein each intake passage is divided by a transverse web or baffle into two symmetrical passages and is tapered forming a restriction located beneath a point where fuel is injected, wherein each symmetrical passage is tapered towards said restriction; axes of said symmetrical passages converging in V-formation down generally to a plane normal to said intake passage containing the point of injection; said transverse web or baffle located at an initial stage of the intake passage and exhibiting an elongated, inverted pear-drop profile in cross-section which ends prior and substantially spaced from said plane.

4,599,978

REED VALVE

Yoshikiyo Kamata, Hachioji, and Yoshiaki Nagao, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Mar. 4, 1985, Ser. No. 707,564
Claims priority, application Japan, Mar. 9, 1984, 59-33910[U]
Int. Cl.[4] F02B *33/04*; F02M *9/10*
U.S. Cl. 123—73 V **3 Claims**

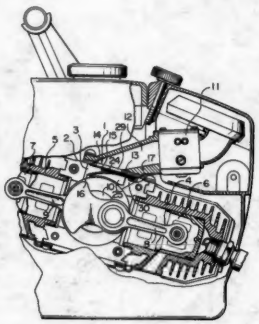
1. A reed valve for use in an intake system communicating with a crankcase of a two-cycle internal combustion engine, which comprises:

a valve body formed with a communicating bore for passing air-fuel, from a carburetor, downstream into said crankcase;

a reed member having one end thereof fixed to a downstream-side surface of said valve body and extending such as to close said communicating bore; said reed member having an upstream and a downstream side; and

a stopper member disposed downstream from said reed member,

wherein said stopper member has one end thereof fixed to said valve body together with said reed member at the fixed end of said reed member and is constituted by a flat plate-shaped member which is curved downstream from said reed member from said one end to its free end, said flat-plate shaped member having one surface facing said



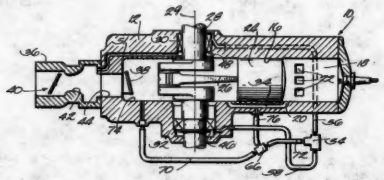
reed member and an opposing surface remote from said reed member and a lump member which is secured to the surface of said flat plate-shaped member which is remote from said reed member, said lump member extending from said free end to about said fixed end, said lump member gradually increasing in thickness from said free end to said fixed end, and having a shape which is substantially coincident with a space which is formed on the downstream side of said reed valve and does not virtually take part in the flow of intake, said lump member being disposed within said space.

4,599,979

UPPER CRANKSHAFT BEARING LUBRICATION SYSTEM FOR TWO-CYCLE ENGINE

Paul W. Breckenfeld, Winthrop Habor; George L. Broughton, Waukegan; David C. Calamia, Grays Lake, and James E. Macier, Waukegan, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 9, 1984, Ser. No. 639,949
Int. Cl.[4] F02B *33/06*; F01M *3/00*
U.S. Cl. 123—73 AD **7 Claims**



1. A two-cycle internal combustion engine including a crankcase, a cylinder extending from said crankcase, a piston mounted in said cylinder for reciprocative movement to alternatively create high and low pressure conditions in said crankcase, an induction passage for introducing a fuel-lubricant-air mixture into said crankcase and including a low pressure zone, a crankshaft having an axis which is generally vertical when said engine is in a normal operating position, upper and lower

bearings rotatably supporting said crankshaft in said crankcase, a sump in said crankcase adjacent said crankshaft and in which engine fuel drains collect, first conduit means connecting said upper bearing in communication with said low pressure zone, second conduit means connecting said upper bearing in liquid communication with said sump and including an intermediate portion, third conduit means connecting said crankcase in an area in spaced relation from said sump and in liquid communication with said intermediate portion, first one-way valve means located between said sump and said intermediate portion for permitting fuel drains to flow from said sump upwardly toward said upper bearing in response to the low pressure condition in said low pressure zone and for preventing flow from said intermediate portion to said sump, and second one-way valve means located between said crankcase and said intermediate portion for permitting flow from said crankcase to said intermediate portion to pump fuel drains from said intermediate portion to said upper bearing when a high pressure condition exists in said crankcase and for preventing flow from said intermediate portion to said crankcase when a low pressure condition exists in said crankcase.

4,599,980

ELECTRIC DEVICE FOR ELIMINATING THE JERKING OF VEHICLES

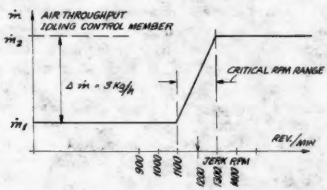
Harald Collonia, Glashütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,639

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1982, 3242483

Int. Cl.⁴ F02M *3/07, 7/12*

U.S. Cl. 123—339 **5 Claims**



1. An electric device for eliminating the jerking of vehicles, particularly automotive vehicles, with internal combustion engine and with a control member which controls the intake thereof, particularly the idling intake, comprising

means for determining the actual speed of rotation of the engine,

first means for comparing said actual speed of rotation to a desired speed of rotation,

second means for comparing the actual speed of rotation of the engine with a set jerk speed of rotation,

means coupled to an output terminal of said second comparing means for producing a drive signal,

control amplifier means connected to an output terminal of said first comparing means for combining an output signal of said first comparing means with the signal of said drive signal means for driving the control member within a predetermined range of speeds of rotation within which the jerk speed of rotation lies, and wherein

said drive-signal means operates the control member to produce an intake which increases with the actual speed of rotation within said speed-of-rotation range.

4,599,981

METHOD OF CONTROLLING AIR-FUEL RATIO OF AN ENGINE

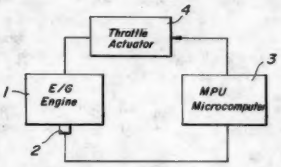
Takashi Miyano, and Shunji Takahashi, both of Oi, Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1984, Ser. No. 671,321

Claims priority, application Japan, Nov. 15, 1983, 58-213397

Int. Cl.⁴ F02D *9/02*

U.S. Cl. 123—361 **7 Claims**



1. In an engine control system, a device for controlling air-fuel ratio of an internal combustion engine having a throttle valve with an actuator, comprising:

means for storing a relation between a throttle valve opening on the engine and air-flow rate in a memory as a fundamental characteristic;

sensor means on the engine for detecting the air-fuel ratio of the engine during its running operation;

means for deriving deviations between values of air-flow rate at given small and large air-flow rate points and values of air-flow rate at corresponding points from the detected air-fuel ratio and the fundamental characteristic respectively;

means for calculating an offset amount relative to the fundamental characteristic from the deviation at the small flow rate point;

means for calculating an inclined angle relative to the fundamental characteristic from the deviation at the large flow rate point; and

means for correcting and controlling an operating amount of the throttle valve actuator by said offset amount and said inclined angle as correction factors.

4,599,982

KNOCK CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

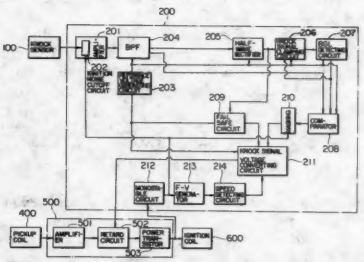
Noboru Sugiura, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,999

Claims priority, application Japan, May 4, 1983, 58-77453

Int. Cl.⁴ F02P *5/155*

U.S. Cl. 123—425 **7 Claims**



1. A knock control apparatus for internal combustion engines comprising:

an amplifier for amplifying a signal generated from a knock sensor for detecting vibration of an engine;

a filter for passing a knocking frequency range of an output from said amplifier;

a rectifier circuit for rectifying an output from said filter;

clamping means for clamping an output from said rectifier at a clamping voltage;

background level detecting means for averaging an output from said clamping means;

means for generating said clamping voltage at which said clamping means clamps the output from said rectifier on the basis of the average voltage from said background level detecting means so that said clamping voltage will continuously change in accordance with changes in the average voltage from said background level detecting means; and

means for comparing the output from said filter with an output value from said background level detecting means to generate a signal for retarding an ignition timing in accordance with a knock intensity.

4,599,983

METHOD AND APPARATUS FOR INJECTING FUEL FOR A DIESEL ENGINE

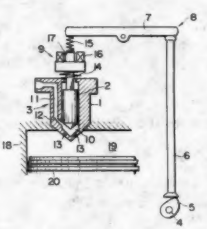
Yoshio Omachi, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,751

Claims priority, application Japan, Nov. 9, 1981, 56-166763; Nov. 9, 1981, 56-179252; Nov. 9, 1981, 56-179253

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—497 **8 Claims**



1. An apparatus for injecting fuel into a combustion chamber for a diesel engine in which an intended fuel injection is carried out by way of the steps of extracting plunger actuating force from an engine driving system via a cam actuating mechanism, accumulating the plunger actuating force in a resilient means in the form of a spring for a certain period of time, releasing the accumulated force by way of deenergization of electromagnetic force and actuating the plunger in a stationary nozzle body affixed to the combustion chamber with the accumulated force to inject fuel into the combustion chamber via stationary injection holes, the apparatus comprising;

a plunger actuating force extracting system including a cam rotated by means of a cam shaft, a vertically extending actuating rod and a rocker arm in operative connection with the upper end of said actuating rod at the one free end thereof,

a coil spring serving as a plunger actuating force accumulating means, said coil spring being disposed between the other free end of the rocker arm and the upper end part of the plunger, and

an electromagnetic coil adapted to release the accumulated plunger actuating force by way of demagnetization which is effected at a predetermined time, said electromagnetic coil being in operative association with the plunger in the nozzle body so as to open the latter during magnetization which is effective in raising up the plunger of which upper part serves as a magnetic core.

4,599,984

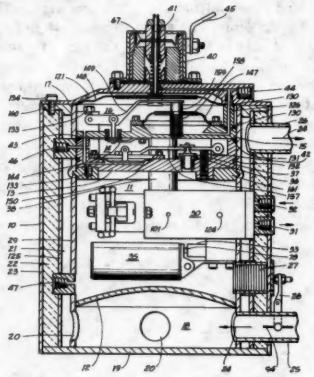
VAPOR FUEL SUPPLY SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Edward O. Kleinholz, 1518 E. Cross St., Tulare, Calif. 93274

Filed Jul. 25, 1983, Ser. No. 516,557

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—557 **13 Claims**



1. In a internal combustion engine including a throttle valve, a mechanical speed control means, and a linkage connecting said mechanical speed control means to said throttle valve, wherein the improvement comprises a generator for producing fuel vapor under relatively high pressure and supplying said fuel vapor to said engine through said throttle valve, the generator comprising a closed pressure boiler compression chamber means; first chamber means positioned adjacent to the boiler compression chamber, second chamber means surrounding the boiler compression chamber, mechanical pumping means positioned within said compression chamber; mechanical pressure reducing means within the generator which reduces the pressure of the fuel vapor produced from said boiler compression chamber to a suitable pressure acceptable for vacuum demand from the engine induction system; air heating means passing ambient air in heat exchange relationship with a heated engine component and air passage means through which said heated air is supplied to the first chamber means from which the heated air flows to the second chamber means; compression chamber pressure controlling means; air motivating means circulating said heated air flow; and electric solenoid means positioned downstream of the pressure reducing means in the fuel vapor flow path, said solenoid means combined with vacuum means and vacuum diaphragm means to initiate and maintain vapor flow in relation to engine demand.

4,599,985

IGNITION COIL FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Dieter Betz, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,210

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1984, 3411843

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—622 **2 Claims**

1. Ignition coil, for a distributorless ignition system of an internal combustion engine, having

at least two primary windings (**6**, **8**);

at least two secondary windings (**10**, **13**), one each being associated with a primary winding;

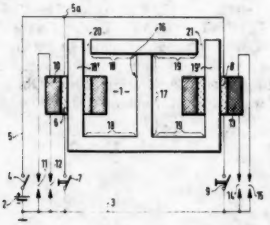
a unitary E-shaped core having a main core portion (**16**), and two secondary core portions (**18'**, **19'**) magnetically cou-

pled to the main core portion and located magnetically in shunt with respect to each other, and forming, with the primary core portion, two parallel secondary magnetic circuits (18, 19),

each secondary core portion having a secondary winding wound thereon,

wherein, in accordance with the the invention,

each secondary magnetic circuit (18, 19) includes a single air gap (20, 21);



a further crossbar core portion, having two free ends, is provided, disposed contiguous to said main core portion (16) and defining, at each of said free ends, one of said single air gaps (20, 21); and

each primary winding is concentric with an associated secondary winding and wound on the secondary core portion which forms part of a respective secondary magnetic circuit (18, 19) including said single air gap (20, 21).

4,599,986

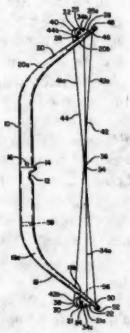
ARCHERY BOW

Jim Z. Nishioka, 1268 Hemlock NW., Salem, Oreg. 97304

Filed Aug. 20, 1984, Ser. No. 642,397

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—24 R **13 Claims**



1. An archery bow comprising

a body portion,

a bowstring on said bow movable rearwardly in drawing movements of the bow, said bowstring having a pre-draw condition, the pre-draw condition being before a draw force is applied to said bowstring,

a nocking point on said bowstring,

first and second oppositely extending arms on said body portion with at least one of said arms being flexible for providing a tension for said bowstring, said arms each having a base portion and an end portion respectively, said base portions connected to said body portion,

bowstring guide means for guiding said bowstring, said bowstring guide means comprising a first rotatable guide member on said first arm end portion and a second rotatable guide member on said second arm end portion,

said bowstring including a main span and a pair of end spans, said bowstring main span extending between said first and second rotatable guide members, said pair of bowstring end spans wrapping around said first and second rotatable guide members respectively,

eccentric means on said bow connected to said first rotatable guide member for controlling a breakover tension in said bowstring,

a compound cable including a compound cable main span and a compound cable end span, said compound cable end span wrapping around said eccentric means, said compound cable main span extending between said eccentric means and said second arm end portion,

shaft means on said second arm end portion rotatably supporting said second rotatable guide member, and

connecting means on said second arm end portion for connecting said compound cable main span to said second arm end portion, said connecting means being positioned on said second arm end portion rearwardly of said shaft means,

said connecting means being non-rotatable during a drawing movement of the bow, and

during a drawing movement of the bow said compound cable main span will exert a portion of the draw force on said second arm end portion rearwardly of said shaft means.

4,599,987

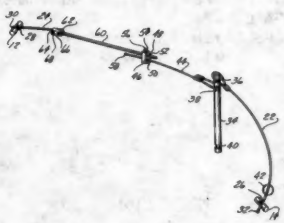
BON STRING CHANGER

Leonard D. Rezmer, Kawkaw, Mich., assignor to The Game Tracker, Inc., Flushing, Mich.

Filed Nov. 29, 1984, Ser. No. 676,438

Int. Cl.[4] F41B *5/00;* **B21F** *9/00*

U.S. Cl. 124—23 R **4 Claims**



1. In a device for facilitating re-stringing of a split limb bow, the improvement which comprises:

a pair of spaced apart handles each handle adapted to engage an associated exterior surface of a limb through a slot formed therein;

a rotatable lever arm movable between a first position and a second position, the second position causing inward compressing of the bow limbs;

a first means for interconnecting one of the handles to the lever arm;

a second means for interconnecting the other of the handles to the lever arm; and

means for variably adjusting the distance between the handles comprising:

an adjustment rod;

a locking block, the locking block being slidably positionable along the length of the rod; and

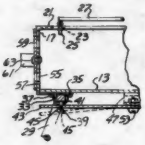
fastening means for locking the locking block in a desired position along the length of the rod.

4,599,988

PORTABLE BARBECUE

Walter Madurski, 17151 Gitre, Detroit, Mich. 48205

Filed Aug. 15, 1985, Ser. No. 765,771
Int. Cl.[4] F24C *1/16*
U.S. Cl. 126—9 R **5 Claims**



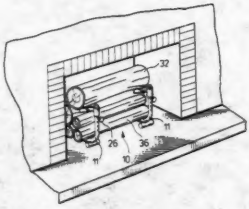
1. A portable barbecue comprising a firebox having bottom, side and end walls;
a grill overlying and removably mounted upon said firebox;
a pair of longitudinally spaced inverted U-shaped legs supportably engaging and pivotally mounted upon the underside of said bottom wall adjacent its opposite ends and extending downwardly and angularly outward for engagement with a support;
and spring detent means upon said bottom wall retainingly engaging and interlocked with said legs when fully open, said legs adapted to pivotally fold into snug engagement with said bottom wall parallel thereto when not in use;
said spring detent means including a leaf spring at one end secured to said bottom wall and adjacent its other end having a lock aperture;
and a detent pin depending from said leg and upon fully open movement of said leg adapted for interlocking registry with said leaf spring lock aperture.

4,599,989

BLACK HOLE FIRE IRONS

G. Ronald Telfer, 9 Burnamthorpe Crescent, Islington, Ontario, Canada M9A 1G5

Filed Nov. 19, 1984, Ser. No. 672,954
Int. Cl.[4] F23H *13/00*
U.S. Cl. 126—164 **5 Claims**



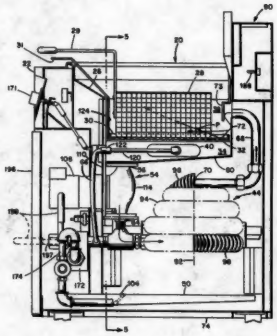
1. A fire iron set for burning logs in a fireplace, comprising:
at least two identical laterally-spaced free-standing separate fire iron members,
each of said fire iron members including a generally horizontal portion having an integrally-formed upwardly-curved portion at one end thereof and an integrally-formed generally upright portion at the other end thereof,
said upright portion having a sleeve member slidably received therein and variable location stop means for preventing downward sliding movement of said sleeve member beyond a preselected one of a plurality of vertical positions on the upright portion,
said sleeve memnber having a rigid arm integrally formed therewith and projecting angularly downwardly in the plane of the fire iron member towards the free end of the upwardly-curved portion.

4,599,990

CONTROL SYSTEM AND METHOD FOR RECIRCULATING-TYPE DEEP FAT FRYER

Donald E. Fritzsche, Chicago Heights, Ill.; Robert A. Panora, Milton, and Matthew D. Bangert, Melrose, both of Mass., assignors to Hobart Corporation, Troy, Ohio and Thermo Electron Corporation, Waltham, Mass.

Filed Aug. 8, 1985, Ser. No. 763,501
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—351 **13 Claims**

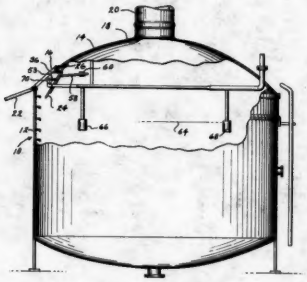


1. In a deep fat fryer having a tank for holding cooking fat, a fat recirculating system comprising tubing located externally of said tank and having an inlet adjacent the bottom of said tank, a return outlet to said tank and a recirculating pump below and adjacent said inlet, an electric motor for said pump, said tubing and tank forming a closed-loop path for recirculating fat during cooking, a heat exchanger encompassing said tubing, a gas burner for delivering heat to said heat exchanger and thereby to liquid fat in said tubing, thermostatic control means for operating said pump motor and burner to maintain said tank fat at a preselected cooking temperature, and flow control means for enabling continuous operation of said pump motor and burner when heat is called for by said thermostatic control means and preventing such continuous operation when said flow control means indicates that pressure in said tubing downstream of said pump is below a predetermined pressure as a result of absence of liquid in said tubing or a liquid pressure level therein below said predetermined pressure,
said flow control means enabling intermittent operation of said pump motor and burner and including pressure switch means, timer means having sequential predetermined-period on and off conditions and circuitry electrically connecting said pressure switch means and timer means to said pump motor and said burner for intermittently operating and discontinuing operation of the motor and burner when said pressure level is below said predetermined pressure, and
a second circuit bypassing said timer means to enable direct energization of said pump motor and burner continuously in response to said thermostatic control means when liquid fills said tubing and its pressure level is above said predetermined pressure.

4,599,991
DOOR FOR BREW KETTLE

James P. Horton; Jerry F. Cebe, both of Albany; Dave Hagemes, Leesburg, and Lewis M. Jeter, Albany, all of Ga., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Oct. 2, 1985, Ser. No. 782,884
Int. Cl.[4] F24H *1/18*
U.S. Cl. 126—345 9 Claims

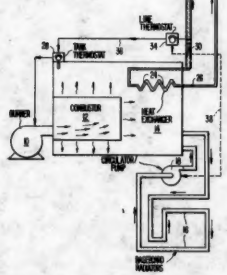


1. A brew kettle, comprising:
a kettle wall, which defines an enclosed vessel and includes an upper wall portion, defining a manhole and a vent hole;
a door mounted inside said upper wall portion so as to pivot about a pivot axis, said door being normally open due to the force of its own weight, and mounted such that, when said door is closed, it closes off said manhole, and, when said door is open, it is stopped before it reaches a vertical position; and
a counterweight arm mounted on said door and extending into said brew kettle so as to substantially reduce the force necessary to close said door.

4,599,992
ANTICIPATORY THERMOSTAT WITH RESET FOR DOMESTIC HYDRONIC BOILER CONTROL

John W. Harding, 1029 Sunset Dr., Blue Bell, Pa. 19422

Filed Aug. 30, 1985, Ser. No. 771,126
Int. Cl.[4] F24H *1/00*
U.S. Cl. 126—351 6 Claims

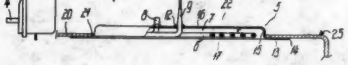


1. In a hot water heating system having
a hot water storage tank;
a combustor arranged inside the hot water storage tank;
a burner means, connected to the hot water storage tank, for firing the combustor;
a plurality of radiators connected to the hot water storage tank;
a pump means, arranged in line with the plurality of radiators, for circulating hot water from the hot water storage tank, through the plurality of radiators, and back to the hot water storage tank;
a tank thermostat means having a high temperature limit, a low temperature limit, and a safety limit which exceeds said high temperature limit, arranged on the hot water storage tank and connected to the burner means, for measuring the temperature of the hot water in the hot water storage tank and for controlling the burner means in response to said temperature of the hot water;
a heat exchanger arranged inside the hot water storage tank;
a cold water inlet line connected to one end of the heat exchanger; and
a hot water outlet line connected to an opposite end of the heat exchanger;
an improvement comprising:
means, arranged around a portion of the cold water inlet line, for heating cold water in said portion of the cold water inlet line;
means, arranged in close proximity to the heating means around said portion of the cold water inlet line, for sensing the temperature of the cold water in said portion of the cold water inlet line; and
a line thermostatic means, connected at one side to the temperature sensing means and connecting at another side to the tank thermostatic means, for anticipatorily controlling firing of the combustor by the burner means via the tank thermostatic means upon the sensed flow of water through the cold water inlet line and maintaining said firing for as long as the cold water flows or until the safety limit is reached.

4,599,993
TEMPERATURE SENSOR

Hermann Knauss, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Oct. 2, 1984, Ser. No. 656,940
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337900
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—374 17 Claims



1. A temperature sensor, which is filled with an expansion fluid and connected via a capillary tube to an expansion member of a regulator, for installation in a fluid container, the sensor comprising a standard component formed from a substantially flat support having a surface defining a sensing tube area and a sensing tube running approximately parallel to the surface in a multiply wound arrangement, the sensing tube being fixed to the inside of the support, yet spaced from the support surface over approximately its entire length to enable and constrain heated fluid in the container to flow around the sensing tube and back into the container, whereby a temperature control system with very low thermal inertia is provided and the sensing tube is protected from damage.

4,599,994

THERMOSIPHON SOLAR WATER HEATER HAVING FREEZE RUPTURE PROTECTION

S. Warren Cole, 4816 Timberline Dr., Austin, Tex. 78746

Filed Apr. 15, 1983, Ser. No. 485,246
Int. Cl.[4] F24J 2/44
U.S. Cl. 126—420 8 Claims

5. A thermosiphon solar water heating system having passive protection against freeze rupture during periods when insufficient solar energy exists for the system to generate heating and ambient air temperature conditions drop to the freezing point of water, comprising;

a solar energy collector for generating heat including a cover for exposure to solar energy and ambient air, a water supply conduit displaced from the cover, and a riser conduit coupled to the water supply conduit and having an outlet;

said riser conduit disposed between the the cover and the water supply conduit so as to be in closer proximity to the cover than the water supply conduit;

said riser conduit transferring heat to the water contained therein during periods when sufficient solar energy exists for the collector to generate heat, to cause water therein to become more buoyant than water in the supply conduit;

said riser conduit cooling the water contained therein more rapidly than the supply conduit cools the water contained in it during periods when insufficient solar energy exists for the collector to generate heat, and allowing the ambient temperature to cause water contained therein to be lowered in temperature to under 4° C. and become more buoyant than water in the supply conduit;

said riser conduit discharging at its outlet water more buoyant than water in the supply conduit; and

a heated water storage tank disposed adjacent and elevated above the solar collector;

means coupled to the outlet of the riser conduit and to the water supply conduit

(a) for delivering water discharged from the riser conduit into contact with water at the lower portion of the storage tank, to produce a quantity of water at a temperature in the range of 2° C. to 6° C. and more dense than water in the riser conduit during periods when insufficient solar energy exists for the collector to generate heat and the ambient temperature causes water in the riser conduit to be lowered in temperature under 4° C., and

(b) for directing the denser water into the supply conduit, to establish circulation through the riser and supply conduits.

6. A thermosiphon solar water heating system having freeze rupture protection, comprising:

a solar energy collector having a channel for conveying water therethrough;

a heated water storage tank disposed adjacent and elevated above the solar collector;

a water supply conduit, for conveying water to the solar energy collector;

a water return conduit for conveying water rising out of the solar energy collector;

an inlet conduit segment coupled to the water return conduit opening to the interior of the storage tank at a first location on the underside thereof for delivering water moving in the water return conduit into contact with water in the lower portion of the storage tank for mixing water conveyed in the water return pipe with heated water in the storage tank to produce water more dense than that in the solar collector during periods when insufficient solar energy exists for the collector to generate heating and the ambient air temperature lowers to the freezing point of water; and

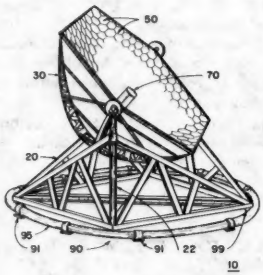
an outlet conduit segment coupled to the water supply conduit opening to the interior of the storage tank at a second location on the underside thereof adjacent to and below the first location, for collecting the denser water and directing it into the water supply conduit to establish water circulation through the solar energy collector.

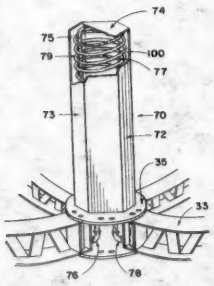
4,599,995

LINEAR COLLECTOR FOR A PARABOLIC REFLECTOR

John A. Dane, 8823 Shellie La., Boise, Id. 83704

Filed Nov. 7, 1984, Ser. No. 668,992
Int. Cl.[4] F24J 2/10
U.S. Cl. 126—438 4 Claims





1. A collector for a parabolic reflector of the type having a multiplicity of individual reflectors terminating in a polygonal rim, said collector comprising:

a housing including an elongated tubular outer shell, and a pair of end members sealingly engaging said shell to define an enclosure, the outer surface of said outer shell having the same polygonal shape in cross section as said individual reflectors;

a water conducting coil mounted within said enclosure, said

coil having a water intake port and a steam outlet port; and

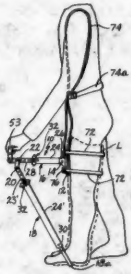
a heat exchange media contained within said enclosure for transferring heat from said housing to said coil.

4,599,996

LEG MANIPULATING DEVICE

Nancy Seith, 8800 Carmichael Dr., Chesterland, Ohio 44026, and Robert C. Johnson, 151 Carriage Dr., Apt. 101, Chagrin Falls, Ohio 44022

Filed Nov. 14, 1984, Ser. No. 671,480
Int. Cl.⁴ A61H *1/02*
U.S. Cl. 128—25 R **17 Claims**



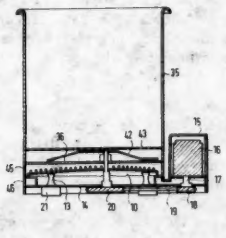
1. A device for facilitating movement by a patient of an incapacitated limb of the patient comprising a base adapted to be supported on the thigh of the patient's limb, a lever pivoted to said base, means attached to said lever and adapted for coupling to the patient's limb generally adjacent the distal end thereof, for connecting the limb to said lever, thereby enabling the patient to shift the incapacitated limb by actuation of said lever, and said lever includes means for selectively adjusting the length of said lever for accommodating the device to different sizes of patients, and wherein said lever at the distal end thereof includes a projecting handle portion, and means for selectively changing the projecting position of said handle portion relative to the remainder of said lever.

4,599,997

MASSAGE APPARATUS WITH A DISENGAGEABLE VIBRATORY MASSAGE PLATE

Heinz Bucher, Rottweil, Fed. Rep. of Germany, assignor to Metronic Electronic GmbH, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,337
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237333
Int. Cl.⁴ A61H *1/00*
U.S. Cl. 128—36 **19 Claims**



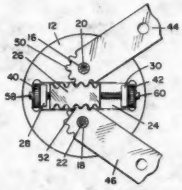
1. Massage apparatus capable of performing both underwater massage and dry vibration massage, the motion of each is derived through engagement means in operative engagement with a drive means rotated by an electric motor, said massage apparatus comprising: a vibratory massage plate (10) having an aperture (12) and an engagement means (33) with an off center through bore receptacle (47); a drive wheel (20) having a hub (22) and a receptacle (23) within said hub (22), where said receptacle (23) is aligned with said off center through bore receptacle (47); a sleeve-shaped drive unit (27) having a lower (28) and upper (29) receptacle, and being axially adjustable with respect to said drive wheel (20), where said engagement means (33) is engaged to by said drive means to impart a vibratory motion to said massage plate (10); and a container (35) above said massage plate (10), said container (35) having a drive shaft (41) rotatably mounted in its bottom portion (36), said drive shaft (41) having an impeller (42) mounted thereon inside said container (35) and having an insertable portion (39) projecting from the underside of said container (35) through said aperture (12) in said massage plate (10) and into non-rotatable engagement with said upper receptacle (29) of said drive unit (27) axially lowering said drive unit (27) into a lower axial position thereby establishing operative engagement in between said drive shaft (41) and said drive unit (27) to impart rotary motion to said impeller (42) and to effect disengagement of said drive unit (27) from said engagement means (33) of said massage plate (10).

4,599,998

ADJUSTABLE POLYCENTRIC ORTHOPEDIC APPLIANCE HINGE

James D. Castillo, 22671 Via Santiago, Mission Viejo, Calif. 92691

Filed Jun. 1, 1984, Ser. No. 616,059
Int. Cl.⁴ A61F *3/00*
U.S. Cl. 128—77 **17 Claims**



13. A polycentric orthopedic appliance hinge comprising a pair of hinge arms each capable of angular displacement over a range of angular displacements about a respectively associated pivot axis;

displacement means in the form of a driven member interposed between and connected to said hinge arms such that it is translated as a consequence of angular displacement of either one of said arms for forcing angular displacement of the other of said arms and such that the angle between the directions of said arms increases or decreases as the sum of their angular displacements; and

stop means in the form of means for limiting displacement of said displaceable driven member for limiting displacement of said arms to a selected segment of said range of angular displacements.

4,599,999

DRILL GUIDE FOR USE WITH SURGICAL COMPRESSION PLATES

Kaj Klaue, Spiegel, Switzerland, assignor to Synthes AG, Chur, Switzerland

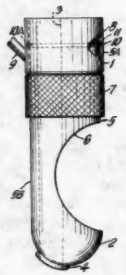
Filed Jun. 11, 1984, Ser. No. 619,488
Int. Cl.⁴ A61F *5/04*
U.S. Cl. 128—92 EB **2 Claims**

1. A drill guide for angularly aligning and guiding a drill with respect to an elongated hole in a bone plate, said elongated hole having an inwardly inclined upper camming surface

and undercut lower surfaces on the side of the plate to be placed in contact with a bone, said drill guide comprising:

an elongated body having at least one hemispherical end surface which bears against the inclined upper surface of said elongated hole and is adapted to be rocked in a plane aligned with the long axis of said plate hole,

a guide hole extending through said body which is eccentric to the axis of said body, and



a protuberant collar extending from said end surface around the end of said guide hole to form an extension of said guide hole,

the walls of said collar being adapted to bear against the undercut surfaces of said plate hole to limit the angular travel of said drill guide when it is rocked in said plate hole.

4,600,000

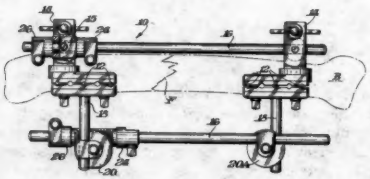
EXTERNAL FIXATION SYSTEM

Charles C. Edwards, 3907 Greenway, Baltimore, Md. 21218

Continuation of Ser. No. 418,705, Sep. 16, 1982, abandoned. This application Apr. 1, 1985, Ser. No. 718,077

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 A **15 Claims**



1. In an external fixation system wherein sets of pins are mounted from a frame on longitudinally opposite sides of a bone fracture, the improvement being said frame including a coupling comprising a rod for being generally longitudinally disposed from one set of pins on one side of the fracture to another set of pins on the other side of the fracture, a sleeve member having a longitudinal passageway extending therethrough, said rod being slidably positioned in said sleeve member, remote stop means coupled to said rod on the side of said sleeve member remote from the fracture, inner stop means coupled to said rod on the side of said sleeve member toward the fracture, adjustable locking means for selectively locking said inner stop means to said rod at a preselected position thereon to control the distance between said stop means whereby the degree of sliding movement of said rod within said sleeve member may be varied to provide a dynamic coupling thereof, said remote stop means and said inner stop means being coupled to said rod without any other components between each stop means and said sleeve whereby said sleeve may directly contact said stop means during said sliding movement, said sleeve member comprising a housing having a longitudinal bore, an inner sleeve positioned in said longitudinal bore and slidably receiving said rod, the outer diameter of said inner sleeve being smaller than the inner diameter of said longitudinal bore to provide clearance between said inner sleeve and the inner surface of said bore whereby said sleeve may be tilted to a position within said bore which is nonparallel with respect to said bore, a stabilizing insert being removably positioned within said housing in said clearance to prevent tilting of said inner sleeve within said bore, and said housing being adapted to be disassembled to permit removal of said insert to permit tilting of said inner sleeve within said outer bore.

4,600,001

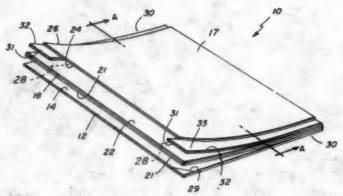
COMBINED WOUND DRESSING AND DELIVERY MEANS COMPOSITE

Thomas Gilman, Palatine, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Aug. 15, 1984, Ser. No. 641,127

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 **6 Claims**



1. A wound dressing and delivery system composite comprising:

a wound dressing layer;

said wound dressing layer having both an adhesive-coated surface and a non-adhesive coated surface disposed on the opposite thereof; and at least one paper tape tab adhered to a peripheral region of said non-adhesive-coated surface of said wound dressing along a margin thereof;

a release liner layer;

said release liner layer being oriented coplanarly adjacent to and releasably secured to said wound dressing layer adhesive surface;

a delivery means for delivering said wound dressing layer to a wound application site;

said delivery means having a first non-adhesive-coated surface and a second non-adhesive-coated surface disposed on the opposite side thereof; said delivery means being coextensive in area with said wound dressing layer; and

said wound dressing layer being centrally disposed between said release liner layer and said delivery means, and further oriented coplanarly adjacent to and releasably secured by means of a heat lamination bond to said second non-adhesive surface of said delivery means layer except in the peripheral region covered by said paper tape tab, said release liner layer being free from heat lamination bond to said paper tab.

4,600,002

DISPOSABLE RESPIRATOR

Richard D. Maryyanek, Northbridge, and Joseph Z. Zdrok, Webster, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 24, 1984, Ser. No. 664,374

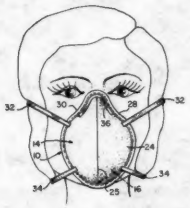
Int. Cl.[4] A62B *7/10*

U.S. Cl. 128—206.19 **7 Claims**

1. A fold-flat, disposable respirator comprising:

a pair of multiple layered webs of flexible air-permeable materials, each web comprising a layer of an aerosol filter-

ing material and a layer of a toxic gas absorbing material, said webs each having one curvilinear edge portion for mating with facial contours and said webs being joined together at a common seam which is vertical as worn, the web edges forming said vertical seam being located on the



interior of said respirator and being covered with a strip of an elastomeric foam coextensive with the length of said seam; and

means for holding said respirator open against a wearer's face.

4,600,003

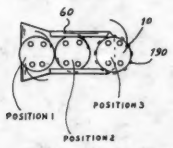
INTRAOCULAR LENS INSERTING TOOL

Octavio Lopez, 111 N. Wabash Ave., Chicago, Ill. 60602

Filed Sep. 8, 1982, Ser. No. 415,804

Int. Cl.[4] A61B *17/00*; A61F *2/16*

U.S. Cl. 128—303 R **5 Claims**



1. A tool for inserting an intraocular lens with haptics into an eye comprising:

an elongated flat member having a longitudinal axis, a top surface and bottom surface;

two opposed spaced side walls at least partially extending longitudinally along said member and terminating above said top surface and adapted to engage said haptics and force them into a closed position around said lens when a portion of said tool is inserted into the eye and said lens is disposed with the eye by sliding it on said flat member between said side walls;

a first end connected to said flat member provided for holding said lens prior to insertion, said first end having a dimension transversal to said longitudinal axis of said flat member, said dimension being larger than a width of said member; and

a second end connected to said flat member opposite said first end adapted to facilitate the insertion of the tool into the eye.

4,600,004

INTRAOCULAR LENS HOLDER AND INSERTER

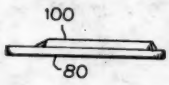
Osvaldo Lopez, 11 N. Wabash, Chicago, Ill. 60602, and Gerald Horn, 5415 W. Sheridan Rd., Chicago, Ill. 60640

Filed Sep. 8, 1982, Ser. No. 415,805

Int. Cl.[4] A61B *17/00*; A61F *2/16*

U.S. Cl. 128—303 R **7 Claims**

1. An apparatus for storing an intraocular lens with haptics for inserting it into an eye comprising an elongated tubular member with a first end for storing said lens said first end having flared sidewalls to engage said haptics when said lens is inserted into the eye and force them around said lens and second end which is open, whereby the lens is inserted by



inserting said second end through an incision in the eye, then sliding said lens through said member into the eye and removing said second end from said eye.

4,600,005

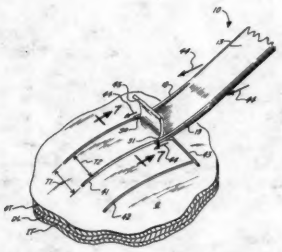
GUIDED OSTEOTOME FOR HARVESTING CRANIAL BONE GRAFT

Philip M. Hendel, 1722 Napoleon Ave., Apt. 1, New Orleans, La. 70115

Filed Aug. 22, 1984, Ser. No. 643,666

Int. Cl.[4] A61B *17/16*

U.S. Cl. 128—304 **14 Claims**



3. A guided osteotome for use in harvesting cranial bone graft material to be used in craniofacial plastic surgery, comprising:

a. an instrument body;

b. blade means carried by the instrument body and including a laterally extending cutting edge;

c. a pair of guide means carried by the instrument body and including surface means, positioned laterally on the side of the blade means, which tract upon the patient's cranium for defining the depth of cut of the blade means so that the blade means does not completely penetrate the cranium and contact underlying brain tissue; and

d. the guide means and blade means being an integral unit which forms a recess through which harvested bone graft material can pass.

4,600,006

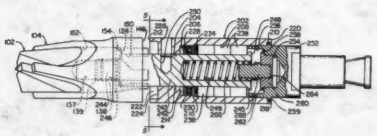
CRANIAL PERFORATOR

John W. Baker, 4 Wachusett Dr., Acton, Mass. 01720

Filed Jan. 31, 1984, Ser. No. 575,571

Int. Cl.[4] A61B *17/16*

U.S. Cl. 128—310 **18 Claims**



1. A drilling implement for drilling holes in bone structure

comprising a drill head assembly and a drill head drive assembly;

said drill head assembly comprising a hollow outer drill member and an inner drill member coaxially disposed within said outer drill member;

said outer drill member comprising an outer end having a plurality of cutting flutes and an inner end having three circumferentially-spaced lips that extend in a plane at right angles to the longitudinal axis of said outer drill member, each of said lips having a drive surface extending in a plane that intersects the plane of said lips;

said inner drill member comprising an outer end having a plurality of cutting flutes and an inner end having (1) an end surface, (2) three circumferentially-extending, mutually-spaced lugs projecting from said end surface para11el to the center axis of said inner drill member, each of said lugs having a cam surface extending circumferentially and at an angle to the longitudinal axis of said inner drill member and disposed to engage one of said drive surfaces and thereby drive said outer drill member when said inner drill member is rotated in a first direction, and (3) a threaded center hole;

said drill head drive assembly comprising a drive member, a drill head/drill drive coupling member, a drive adaptor, and biasing means;

said drive member comprising an end surface extending transversely of its axis and interrupted by three recesses for receiving said three lugs, each of said recesses being defined in part by side surfaces extending in planes extending parallel to the center axis of said drive member;

said coupling member being screwed into said threaded center hole so that is and said inner drill member will rotate as a unit when said inner drill member is rotated in a said first direction;

said drive adaptor being connected to said drive member so that said drive adaptor and said drive member will rotate as a unit when said drive adaptor is rotated in said first direction; and

said biasing means being disposed so as to bias said coupling member and said inner drill member axially away from said drive adaptor;

said drill head assembly and said drill head drive assembly being arranged so that when said drive adaptor is rotated in said first direction, (a) so long as said inner drill member encounters a predetermined resistance to penetration, said lugs will remain engaged with said side surfaces and said inner drill member will cause said outer drill member to rotate with it as a unit with said drive adaptor, and (b) when said inner drill member no longer encounters said predetermined resistance to penetration, said cam surfaces will coact with said drive surfaces to force said inner drill member forward relative to said outer drill member and said drill head drive assembly sufficiently for said lugs and said side surfaces to be disengaged, whereby said inner and outer drill members will slip relative to said drive member as said drive adaptor is rotated in said first direction.

4,600,007

PARAMETRIUM CUTTING FORCEPS

Johann Lahodny, Gmünd, Austria, and Ernst Dreier, Steckborn, Switzerland, assignors to Fritz Gegauf AG Bernina-Nähmaschinenfab., Steckborn, Switzerland

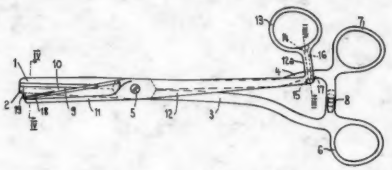
Filed Aug. 13, 1984, Ser. No. 640,309

Claims priority, application Switzerland, Sep. 13, 1983, 4972/83; European Pat. Off., Feb. 2, 1984, 84810060.8

Int. Cl.[4] A61B *17/32*

U.S. Cl. 128—318 **8 Claims**

1. Parametrium shearing forceps having clamping jaws, a locking device for stopping the clamping jaws in a clamping position, and a cutting blade, each of said clamping jaws having a single continuous clamping surface extending over substantially the full width of the clamping jaw, said cutting blade being provided on the side of the clamping jaws outside said clamping surfaces, said cutting blade having a cutting edge, an ineffective open position of said cutting blade for which its cutting edge is adjacent to the side of one clamping jaw and covered and protected by this one clamping jaw, a counter



cutting edge at one side of the other of said clamping jaws, said cutting blade being displaceable from its ineffective position to a cutting position for shearing clamped tissue of a section of the length of the clamping jaws at the side of said clamping jaws, by cooperation of said cutting edges.

4,600,008

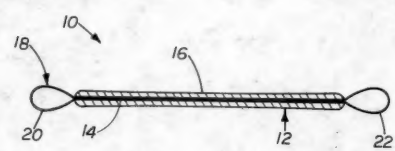
INSTRUMENT FOR REMOVING FOREIGN SUBSTANCES FROM THE EYE

Richard G. Schmidt, Rte. #1, Box 259, Jackson, Mo. 63755

Filed Jan. 9, 1984, Ser. No. 569,467

Int. Cl.[4] A61B *17/50*

U.S. Cl. 128—357 **9 Claims**



1. Means for removing foreign substances from the surface of an eye comprising an elongated member of tubular construction having first and second opposite end portions, a flexible thread-like member, and means including a passageway through said elongated member for cooperatively receiving said thread-like member for slidable movement therein, said thread-like member having one portion thereof extending from the first end portion of said elongated member and another portion thereof extending from the second end portion of said elongated member, each of the extending portions of said thread-like member forming a respective loop element at the first and second end portions of said elongated member, the relative size of one of said loop elements being altered by effecting movement of the other of said loop elements relative to said elongated member, each of said loop elements being adaptable for engaging and manipulating on the surface of the eye to remove foreign substances therefrom.

4,600,009

TANNING SYSTEM

Sharon D. Kramer, Rte. 6, Box 233; John Kramer, 806 Lynn Pl.; Donald Kramer, 9913 W. Meadowbrook, and Clark Kramer, Rte. 6, Box 255K, all of Yakima, Wash. 98907

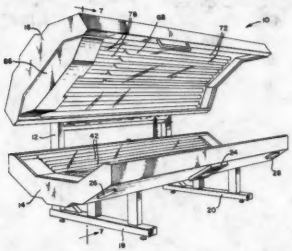
Filed Aug. 20, 1984, Ser. No. 642,565

Int. Cl.[4] A61N *5/06*

U.S. Cl. 128—396 **3 Claims**

1. A tanning system including a facial tanning unit as an integral part thereof comprising a support means a first series of elongated ultraviolet light generating body lamps supported by the support means, and a second series of shorter ultraviolet

light generating facial lamps supported by the support means and extending longitudinally between and in alternating fash-



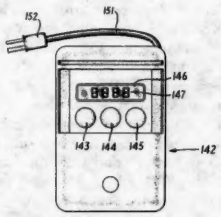
ion with said first series of lamps, said second series of lamps being generally coextensive longitudinally with each other.

4,600,010

ELECTRIC STIMULATOR AND TEST INSTRUMENT THEREFOR

Richard S. Dugot, New York, N.Y., assignor to Biolectron, Inc., Hackensack, N.J.

Filed Oct. 4, 1984, Ser. No. 657,803
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—419 F **12 Claims**



1. Portable, light weight apparatus for treating a living body comprising signal generator means for generating a treatment signal, means connected to said signal generator means for applying said treatment signal to a living body to be treated, and means for providing indications of at least one operation condition of said apparatus, wherein the improvement comprises

normally disabled means responsive, when enabled, to said operating condition of said apparatus for generating a retrievable representation of said operating condition, said last named means including means for storing said retrievable representation temporarily and being arranged to be enable by transmission thereto of an interrogating signal from an external source connectible to the apparatus, and

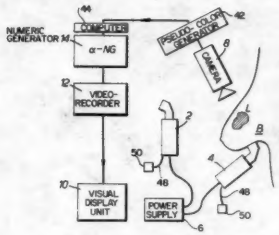
means arranged to be rendered operative by signals from said external source for transmitting a retrievable representation stored by said storing means as an output from the apparatus.

4,600,011

TELE-DIAPHANOGRAPHY APPARATUS

David J. Watmough, Aboyne, United Kingdom, assignor to The University Court of The University of Aberdeen, Aberdeen, Scotland

Filed Nov. 1, 1983, Ser. No. 547,500
Claims priority, application United Kingdom, Nov. 3, 1982, 8231404
Int. Cl.[4] A61B *6/12*
U.S. Cl. 128—664 **18 Claims**



1. A tele-diaphanography apparatus suitable for transilluminating human or animal tissues, which apparatus comprises a first source of light of wavelength from 300 Nm to 2000 Nm, a first housing in which said first light source is mounted, a first light exit aperture in said first housing, a first means for directing onto the tissue to be examined transillumination light which is emitted by said first source of light through said first light exit aperture, a heat absorbing filter for absorbing infrared radiation, said filter being located in the path of the light from said first light source to the tissues to be examined; a second source of light of wavelength from 300 Nm to 2000 Nm, a second housing in which said second light source is mounted, a second light exit aperture in said second housing, a second means for directing onto the tissues to be examined light which is emitted by said second source of light through said second exit aperture; power supply means for controlling the first and second light sources; means for connecting said first and second light sources to said power supply means; a light detector for detecting the light emitted from said second light source and transmitted through the transilluminated tissue being examined, said light detector adapted to be positioned in use on the opposite side of the tissue from said second source of light; a visual display unit connected to said light detector for displaying an image detected by said light detector; and recording means for recording the image detected by said light detector.

4,600,012

APPARATUS FOR DETECTING ABNORMALITY IN SPINAL COLUMN

Yoshimi Kohayakawa, and Machiko Matsushita, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,547
Int. Cl.[4] A61B *5/10*
U.S. Cl. 128—665 **9 Claims**

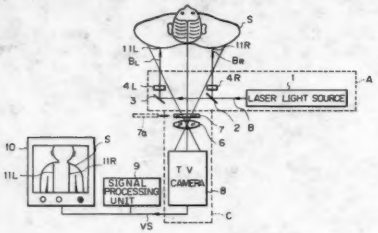
1. An apparatus for detecting an abnormality in the spinal column of a patient, comprising:

means for projecting at least two lines of light onto a patient's back in such a manner that the lines are substantially parallel to the vertical midline of the patient's body and border the midline on either side of the midline;

means for detecting an image of the lines projected onto the patient's back and for generating a signal representing said image;

signal processing means for enabling a comparison of the rela-

tive position of the lines in said detected image from said signal; and



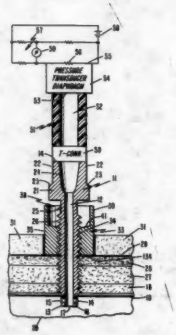
means for indicating an abnormality or lack of abnormality in the patient's spine from the comparison.

4,600,013

INTRACRANIAL PRESSURE MONITORING PROBE

Howard Landy, 10940 SW. 125 St., Miami, Fla. 33176, and Lawrence Landy, 6866 Sunrise Ter., Coral Gables, Fla. 33133

Filed May 8, 1984, Ser. No. 608,204
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **17 Claims**



1. A probe for enabling intracranial pressure in the subarachnoid space to be determined, the probe being inserted through an opening in the scalp, into and through the outer table, diploe and inner table of the skull and dura mater and into the subarachnoid space, the probe comprising:

a threaded shaft having a lumen, opening means at the proximal end of the lumen, the opening means communicating with the lumen and the subarachnoid space so that the subarachnoid fluid is coupled into and through the shaft opening means into the shaft lumen and can be coupled thence to a pressure transducer, the threaded portion of the shaft having a length sufficient to threadingly engage the outer table, the diploe and the inner table, and

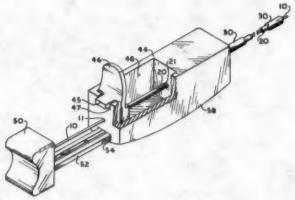
a lock nut means for threadingly engaging the threaded portion and for bearing against the hard outer table, said lock nut means being dimensioned to fit into the scalp opening the shaft threads engaging the outer and inner tables and the diploe cooperating with threads of the lock nut means when the lock nut means is screwed on the threads of the shaft against the outer table to securely hold the shaft in place.

4,600,014

TRANSRECTAL PROSTATE BIOPSY DEVICE AND METHOD

Dan Beraha, 912 Woodbriar Ct., Fort Walton Beach, Fla. 32548

Filed Feb. 10, 1984, Ser. No. 579,158
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—754 **9 Claims**



1. A biopsy device comprising:

(a) a handle formed to fit an operator's head;

(b) a set of three telescoping elements projecting from said handle in which

(i) an outer one of said elements is a cylindrical guide tube having distal and proximal ends, said proximal end fixedly attached to said handle,

(ii) a middle one of said elements is a cutting cannula slidably disposed within said guide tube and having a sharpened distal end thereof which in a first position is retracted into the distal end of said guide tube and which in a second position is extended a preselected distance from the distal end of said guide tube, and a proximal end within said handle said proximal end including means slidably attached to said handle,

(iii) an inner one of said elements is a sampling stylet slidably disposed within said cannula and having a pointed distal end, a transverse sampling notch adjacent said stylet distal end, and a proximal end projecting through said handle;

(c) a push knob attached to said proximal end of said stylet, said knob having a first position in which the pointed distal end of said stylet projects slightly beyond said distal end of said guide tube and a second position in which said pointed distal end of said stylet projects beyond said distal end of said guide tube a distance to expose said sampling notch when said cannula is in its first position; and

(d) means associated with said handle for moving said cannula between said first position and said second position, said cannula in said second position covering said sampling notch of said stylet.

9. A method of obtaining a tissue sample from a prostate gland utilizing a biopsy device having a guide tube attached to a handle, an extendable cannula telescopically disposed in the guide tube and having a sharpened distal end thereof and a thumb tab at its proximal end for extending the cannula, and an extendable sampling stylet telescopically disposed in the cannula having a sharpened distal end, a sampling notch adjacent the distal end, and a knob at its proximal end for extending the stylet, comprising the steps of:

placing the handle of the biopsy device in the palm of one hand with the distal end of the guide tube held in contact with the tip of the index finger of that hand;

inserting the index finger and the guide tube transrectally to contact the rectal wall adjacent the prostate gland of the patient;

locating a desired area of the gland with the tip of the finger and holding the distal end of the guide tube at a desired point in the area;

holding the handle and guide tube steady with the hand;

moving the stylet knob in the extending direction using the other hand so as to cause the sharpened distal end of the

stylet to penetrate the gland at the desired point and to cause tissue of the gland to project into the notch;

slicing a core of tissue in the stylet sampling notch by moving the cannula by means of the thumb tab in the extending direction into the tissue of the gland using the other hand; and

withdrawing the index finger, the guide tube, the stylet and the cannula from the gland and the rectum.

4,600,015

PATIENT MONITORING APPARATUS AND METHOD

John M. Evans, Abingdon, England, and Colin C. Wise, Cardiff, Wales, assignors to Antec Systems Limited, Oxford, England

Continuation-in-part of Ser. No. 314,413, Oct. 23, 1981, Pat. No. 4,502,490. This application Dec. 28, 1984, Ser. No. 687,742

Claims priority, application United Kingdom, Oct. 28, 1980, 8034669; Dec. 11, 1980, 8039741; Jun. 26, 1984, 8416219

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—780 16 Claims

1. Patient monitoring apparatus comprising an oesophageal probe including an oesophageal balloon for provoking the oesophagus of a patient to cause contractions therein, means for applying a fluid under to the oesophageal balloon, a sensor for detecting signals indicative of oesophageal contractions in the oesophagus of the patient, means for deriving from the said signals an output indicative of the degree of anaesthesia of the patient, and means for protecting the oesophagus of the patient from leakage of the fluid from the probe.

4,600,016

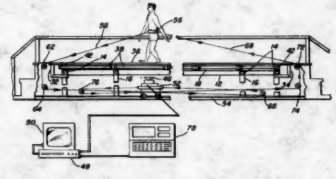
METHOD AND APPARATUS FOR GAIT RECORDING AND ANALYSIS

Timothy L. Boyd, Ringgold, Ga., and Dennis L. Bizzoco, Signal Mountain, Tenn., assignors to Biomechanical Engineering Corporation, Chattanooga, Tenn.

Filed Aug. 26, 1985, Ser. No. 769,437

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—782 20 Claims



6. Apparatus for use in analyzing the natural gait of a subject while striding comprising, an elongated transparent platform having a surface on which the subject may make a number of strides, a camera, means for mounting said camera for viewing from beneath said platform the plantar aspects of at least one foot of said subject, and drive means for moving said camera in response to the strides of the subject so that the plantar aspects of said foot may be monitored throughout at least one full gait cycle while the subject is moving.

4,600,017

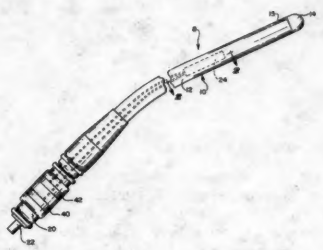
PACING LEAD WITH SENSOR

Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jul. 19, 1984, Ser. No. 632,625

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—784 15 Claims



1. An integral pacing lead comprising:

a flexible lead body having a generally cylindrical outer wall surface, a lumen within and extending the length of said lead body, a given wall thickness, a proximal end, a proximal end portion, a distal end, and a distal end potion; a tip electrode mounted at said distal end of said lead body for pacing a heart muscle; a pacer terminal pin extending from said proximal end of said lead body; first and second spaced apart metallic sleeve connectors on said proximal end portion; a pacer wire conductor within said lumen of said lead body and having a distal end connected to said tip electrode and a proximal end adapted to be connected to a pacer through said pacer terminal pin; piezoelectric pressure sensing means mounted in said lead body distal end portion adjacent to said outer wall surface and at a pre-determined distance behind said tip electrode for generating, from inside the heart, a waveform of heart activity in response to changes in right ventricular blood pressure, said waveform showing openings and closings of the tricuspid valve in the right ventricle of a heart when said lead body distal end portion is received in the right ventricle of a heart; and first and second wire conductors in said lead body, each wire conductor having a distal end connected to said piezoelectric pressure sensor means and a proximal end connected to said first or second sleeve connector; said sleeve connectors being electrically isolated from each other and electrically isolated from said pacer terminal pin, and being adapted to be received in a socket in a pacer and to make contact with ring connectors positioned in the socket.

4,600,018

ELECTROMAGNETIC MEDICAL APPLICATORS

James R. James, Swindon; Reginald H. Johnson, Malvern; Ann Henderson, and Mary H. Ponting, both of Swindon, all of England, assignors to National Research Development Corporation, London, England

Filed May 31, 1983, Ser. No. 499,544

Claims priority, application United Kingdom, Jun. 2, 1982, 8216129

Int. Cl.[4] A61N *5/00*

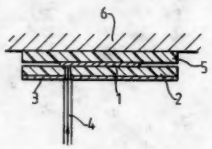
U.S. Cl. 128—804 6 Claims

1. An electromagnetic medical applicator comprising:

a single patch resonator on a substrate backed by a ground-plane, and electrical input connection means to said resonator and ground-plane;

said resonator being in substantially surface-to-surface contact with a layer of material whose opposite surface, in use, faces the body of a patient and through which electromagnetic radiation passes into the body, said material having a wave-impedance $\sqrt{\mu_r/\epsilon_r}$, where μ_r and ϵ_r are

respectively the relative magnetic permeability and permittivity for the layer material, which approximately matches that of human tissue at the operating frequency, the value of ϵ_r for the material being not less than for a material having $\mu_r=1$ which produces said approximate match;



at least said substrate containing both dielectric and magnetic material (a material having $\mu_r<1$) and said substrate having a resultant value of $\sqrt{\mu_r\epsilon_r}$ about equal to or greater than that of said layer, whereby to reduce the surface dimensions of said patch resonator at a predetermined input frequency relative to those dimensions in the absence of said magnetic material.

4,600,019

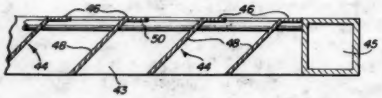
CORN COB SAVER SIEVE FOR COMBINES

Chester L. McBroom, R.R. No. 6 Box 351, Princeton, Minn. 55371

Continuation of Ser. No. 539,296, Oct. 5, 1983, abandoned. This application May 13, 1985, Ser. No. 733,193

Int. Cl.[4] A01F *12/44*

U.S. Cl. 130—27 Z **3 Claims**



1. A cob saver sieve for use in a combine harvester or other harvester equipment and comprising:

(A) a rectangular frame having longitudinally extending side members and transversely extending end members;

(B) a series of inclined vanes disposed between the frame side members in parallel relationship to the frame end members, each vane having a substantially horizontal top limb, and said limbs together defining the top surface of the cob-saving sieve; and

(C) a plurality of transversely spaced and longitudinally extending vane support rods attached between the frame end members and passing through aligned openings in the respective vanes adjacently below the top limbs thereof.

4,600,020

DUAL-ROD CIGARETTE MANUFACTURING MACHINE

Riccardo Mattei, and Bruno Belvederi, both of Bologna, Italy, assignors to G.D Societa' per Azioni, Bologna, Italy

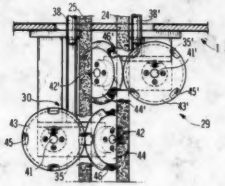
Filed Apr. 29, 1985, Ser. No. 727,558

Claims priority, application Italy, May 4, 1984, 3450 A/84

Int. Cl.[4] A24C *5/14*

U.S. Cl. 131—84.4 **3 Claims**

1. A dual-rod cigarette manufacturing machine (2) comprising means (3, 4) for forming two continuous streams of tobacco (24, 25), essentially-parallel, coplanar conveyor belts (5, 6) for transferring the tobacco streams (24, 25) to an unloading point (13) and, along the route of each of the two belts (5, 6), a tobacco stream (24, 25) shaving device (29, 30) consisting of a pair of counter-rotating discs (43', 44'; 43, 44) located respectively inside and outside the clearance between the tobacco streams (24, 25), having respective cutting edges and arranged with the edges essentially tangent along the course of the respective tobacco stream (24, 25), characterized in that, on each shaving device (29, 30), the discs (45', 45) outside the clearance between the tobacco streams (24, 25) is essentially flat with its axis essentially perpendicular to the plane of the



belts (5, 6), whereas the discs (44', 44) inside the clearance between the tobacco streams (24, 25) is mounted on a slant in relation to the plane and converging, on the side opposite to the tobacco streams (24, 25), with the axis of the flat discs (45', 45).

4,600,021

METHOD FOR SEPARATING TOBACCO PARTICLES ON CIGARETTE MANUFACTURING MACHINES

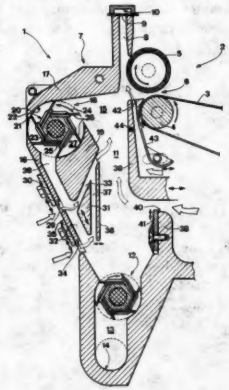
Riccardo Mattei, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

Filed Jun. 1, 1984, Ser. No. 616,154

Claims priority, application Italy, Jun. 14, 1983, 3461 A/83

Int. Cl.[4] A24C *5/39*

U.S. Cl. 131—110 **9 Claims**



6. A method for separating tobacco particles in a cigarette manufacturing machine having a receiving chamber for a flow of shredded tobacco particles; a supply and a reject channel extending upwardly and downwardly from said receiving chamber respectively, said supply and reject channels being substantially aligned with each other; a bypass channel having an inlet which communicates with said receiving chamber, and an outlet which communicates with said reject channel; and conveyor means arranged within said by-pass channel and comprising at least one particle-accommodating pocket-defining member movable along a portion of said by-pass channel from a first particle-receiving position, in which said pocket communicates with said receiving chamber, and through a second position in which said pocket is isolated in an airtight manner from said receiving chamber; the method comprising the steps of:

reducing the air pressure in said supply and reject channels and in said receiving chamber so as to generate a main air

current flowing upwardly along said reject and supply channels and across said receiving chamber;

feeding said tobacco particles at relatively high speed into said receiving chamber and across said main air current towards the inlet of said by-pass channel and into said pocket-defining member in said first position;

operating said conveyor means so as to move at a relatively low speed said pocket-defining member from said first to said second position;

increasing the air pressure within said pocket when said pocket-defining members moves through said second position;

generating at least one secondary air current flowing upwardly into said main current and across a low portion of said reject channel;

dropping said particles at said relatively low speed from said pocket-defining member into said low portion of said reject channel and across said secondary air current.

4,600,022

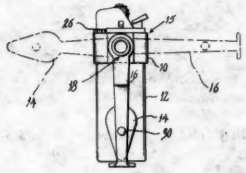
COMPOSITE SMOKER'S KIT

Howard E. Pierce, Jr., 47 Marine St., Thomaston, Conn. 06787

Filed Feb. 11, 1985, Ser. No. 700,481

Int. Cl.[4] A24F *9/10, 13/24*

U.S. Cl. 131—243 **4 Claims**



1. A composite smoker's kit comprising at least one smoker's tool for preparing smoking material in combination with a disposable smoker's lighter, said lighter having an elongated lighter body wherein said body has a substantially ovate transverse cross-section, first means for removingly securing said at least one smoker's tool to said lighter body comprising a spring clip, second means pivotally mounting said at least one smoker's tool to said spring clip, and third curvature means formed on said at least one tool for contacting the lighter body when the longitudinal axis of each of the at least one tool and the lighter body are substantially parallel to provide a detent home position for the at least one tool.

4,600,023

PROCESS FOR THE PREPARATION OF AROMATIC SUBSTANCES FROM DITERPENE FRACTIONS

Werner Hass, Hamburg, and Volker Heemann, Reinbek, both of Fed. Rep. of Germany, assignors to B.A.T. Cigaretten Fabriken GmbH, Hamburg, Fed. Rep. of Germany

Filed May 18, 1984, Ser. No. 611,755

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318546

Int. Cl.[4] A24B *15/30*

U.S. Cl. 131—275 **14 Claims**

1. A process for producing aromatic substances comprising:

providing a diterpene fraction in a solvent; and

oxidizing said diterpene fraction in the absence of photochemically active radiation with

a catalyst/oxidizing agent system wherein

said catalyst/oxidizing agent system is selected from the group consisting of osmium tetroxide/sodium metaperiodate, osmium tetroxide/hydrogen peroxide/sodium metaperiodate, potassium permanganate/sodium metaperiodate, cerium(IV) sulfate/hydrogen peroxide, osmium tetroxide/hydrogen peroxide, silver fluoborate/-hydrogen peroxide and silver nitrate/sodium peroxodisulfate.

4,600,024

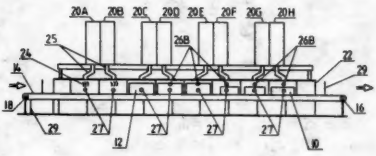
TOBACCO SEPARATION PRETREATMENT SYSTEM

Leon Edwards, 5724 Forrest Ave., Richmond, Va. 23225

Filed Jun. 15, 1983, Ser. No. 504,406

Int. Cl.[4] A24B *15/22*

U.S. Cl. 131—299 **6 Claims**



1. A method of reducing the force with which the constituents of bales or other types of packs of compacted tobacco leaves and/or unshredded parts of tobacco leaves adhere to each other, comprising the step of subjecting the packs to the action of microwaves.

4,600,025

SMOKING PRODUCTS COMPRISING NICOTINE SUBSTITUTES

Ronald E. Grigg, and Kitti Amornraksa, both of The Queen's University of Belfast, Dept. of Chemistry, David Keir Bldg., Belfast, BT9 5AG, Northern Ireland

Continuation-in-part of Ser. No. 442,738, Nov. 18, 1982, abandoned, which is a continuation of Ser. No. 234,803, Feb. 17, 1981, abandoned. This application May 6, 1983, Ser. No. 492,256

Int. Cl.[4] A24B *15/30, 15/38, 15/40*

U.S. Cl. 131—335 **1 Claim**

1. A smoking product comprising an inert combustible substrate to which has been applied a nicotine-substitute-effective amount of a compound selected from the group consisting of 2-methyl-5-(pyrrolidinomethyl)thiazole and 2-methyl-5-(piperidinomethyl)thiazole, and the acid addition salts thereof.

4,600,026

TOBACCO COMPOSITION WITH BLUISH DOGBANE AND A PROCESS FOR THE PREPARATION THEREOF

Dong-Fen Qu, c/o Beijing Cigarettes Factory, Beijing, China

Filed Mar. 14, 1985, Ser. No. 711,620

Int. Cl.[4] A24B *15/16, 15/28;* **A24D** *1/18*

U.S. Cl. 131—335 **24 Claims**

1. A tobacco composition for alleviating chronic bronchitis comprising:

(a) tobacco; and

(b) bluish dogbane extract in an amount of at least 0.1% by weight based on the total dry weight tobacco composition.

4,600,027

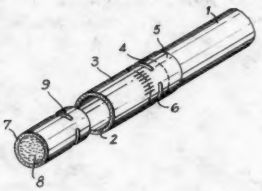
CIGARETTE AND METHOD OF MAKING IT

Willie G. Houck; Reginald W. Newsome; Walter A. Nichols, all of Richmond, and Richard A. Thesing, Glen Allen, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 401,380, Jul. 23, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,599

Int. Cl.[4] A24D *3/04*

U.S. Cl. 131—336 38 Claims



1. A filter cigarette, comprising:

a substantially cylindrical tobacco rod;

a substantially cylindrical, wrapped filter plug, wherein the filter plug has first and second ends open to permit the passage of air and smoke, the wrapping has a first opening therein, the tobacco rod and the filter plug are axially aligned in abutting, end-to-end relationship;

tipping paper wherein the tipping paper has a second opening therein and circumscribes and joins the tobacco rod to the filter plug;

at least one of said wrapping and said tipping paper being substantially air-impermeable;

means for rotating one opening relative to the other so that the first and second openings are in varying degrees of registry to admit varying amounts of air to the filter plug, thereby diluting the smoke; and

means for retaining the tipping paper against axial movement relative to the filter plug.

4,600,028

SATURATED END WRAP CONSTRUCTION AND COMPOSITION

Walter W. Edman, and Ernest J. Klemm, both of Westport, Conn., assignors to Zotos International Inc., Stamford, Conn.

Filed Aug. 29, 1983, Ser. No. 527,039

Int. Cl.[4] A45D *7/00, 19/00*

U.S. Cl. 132—7 9 Claims

1. A method for permanently waving a head of hair comprising the steps of:

A. sectioning the head of hair into a plurality of separate hair fiber sections to be curled;

B. applying an end wrap saturated with a disulfide to the ends of the hair fibers of one section;

C. winding the disulfide saturated end wrap and the hair fibers onto a curling rod;

D. fastening the curling rod in place once the entire hair section has been rolled thereon;

E. repeating step B-D until all of the hair fiber sections and the saturated end wraps have been wound on curling rods;

F. treating the wound hair on each rod with a permanent waving lotion;

G. rinsing the entire head of hair with water after the permanent waving lotion has had sufficient time to act on the hair fibers;

H. drying the rinsed hair with a towel;

I. applying a neutralizing lotion to the permanently waved head of hair;

J. loosening all of the wound tresses; and

K. thoroughly rinsing the entire head of hair with water.

4,600,029

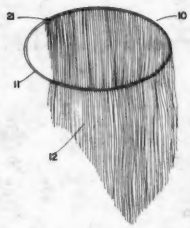
HAIRPIECES

Maria Ueberschaar, 2910 N. Bay Dr., Westlake, Ohio 44145

Filed Oct. 16, 1981, Ser. No. 311,823

Int. Cl.[4] A41G *3/00*

U.S. Cl. 132—53 5 Claims



1. A hairpiece comprising an endless thread-like thin circlet of a size and dimension to encircle a rounded portion of a wearer's head, said circlet having a number of hairs individually secured thereto whereby said hairpiece is adapted to lay on the scalp of the wearer immediately between adjacent roots of the natural hair on the wearer's head.

4,600,030

COSMETIC ARTICLE

David M. Newman, 3106 19th St., N.W., Washington, D.C. 20010

Filed Jun. 21, 1984, Ser. No. 622,879

Int. Cl.[4] A45D *40/30*

U.S. Cl. 132—88.5 2 Claims

1. A cosmetic article comprising:

an artificial finger nail made of a metal foil, said artificial finger nail having a coating consisting of a film of pressure sensitive hot melt adhesive, said adhesive consisting essentially of a mixture of styrene-butadiene copolymer, milled block styrene-butadiene rubber, hydrogenated rosin ester, polymerized trimethyl dihydroquinoline, and petroleum oil.

4,600,031

BALL COCK AND FLOAT ASSEMBLY

R. Frank Nestich, Glenmont, Ohio, assignor to Clevepak Corporation, Purchase, N.Y.

Filed May 20, 1985, Ser. No. 735,588

Int. Cl.[4] F16K *24/02, 31/26, 33/00*

U.S. Cl. 137—218 9 Claims

1. A ball cock for a flush tank comprising:

a shank portion adapted to pass through a wall of the reservoir tank for connection to a supply line;

post means extending upwardly from said shank portion;

extension means telescopically slidable on said post means;

float means mounted on said extension means for vertical movement;

lock means connected between said post means and said extension means to permit a selective, in gross, vertical adjustment of said float means;

horizontally disposed teeth means being presented from said post means;

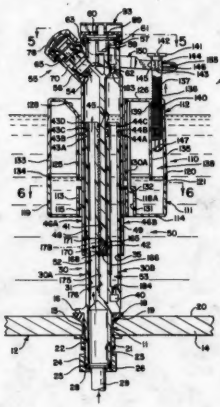
a lock plug rotatably supported from said extension means and disposed transversely of said post means;

a pluraltiy of stria extending along said plug means selectively to inter-engage with said teeth means and thereby secure the selected vertical, in gross, adjustment of said float means;

a valve means carried by said support means upwardly of said float means;

an inlet passage communicating from said shank portion to said valve means;

a discharge passage communicating from said valve means into the flush tank; and,



means communicating between said discharge passage and the atmosphere to serve as a siphon-break in the event of any attempted reverse flow through said discharge passage.

4,600,032

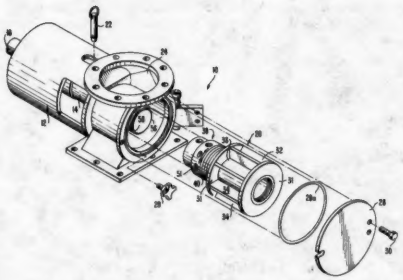
ROTARY SHAFT SEAL ASSEMBLY

Robert D. Heyl, Williamsport, Pa., assignor to The Young Industries, Incorporated, Muncy, Pa.

Filed Apr. 25, 1985, Ser. No. 727,072

Int. Cl.[4] F16K *43/00*

U.S. Cl. 137—315 **16 Claims**



1. A rotary valve comprising:

a housing including an inlet, an outlet, and an access end,

a detachable closure means attached to said housing for closing said access end,

a drive shaft journalled in said housing and having a shaft end disposed generally between said inlet and said outlet,

a rotor mounted on said shaft end and having a surface including at least one recess, which is communicable with said inlet and with said outlet by rotating said drive shaft, for conveying material from said inlet to said outlet, said rotor being mounted directly on said shaft end by a releasable means,

said housing including a surface defining means for defining an inwardly-disposed cylindrical surface generally concentric about said drive shaft,

a seal positioned between said drive shaft and said cylindrical surface and having a seal outer surface engaging said cylindrical surface;

a retaining means for retaining said seal directly on said rotor and relative to said drive shaft so that said seal rotates with said drive shaft and said seal outer surface rotates relative to, and provides a seal with, said cylindrical surface, and said rotor and said seal being removable from said housing as a single unit upon the removal of only said closure means and said releasable means for cleaning and/or repair of said single unit.

4,600,033

GUARD FOR GAS CYLINDER VALVE

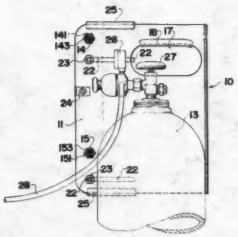
Michael Baron, 460 Dumoulin Street, Winnipeg, Manitoba, Canada R2J 0B5

Filed Oct. 17, 1984, Ser. No. 661,898

Claims priority, application Canada, Nov. 17, 1983, 441355

Int. Cl.[4] F16L *35/00*

U.S. Cl. 137—382 **15 Claims**



1. A guard for a cylinder for compressed gas having a valve, gauge and regulator at one end, the guard comprising a sleeve member having a part circular cylindrical portion having a diameter substantially equal to the outside diameter of the cylinder and having longitudinal edges defining an axially opening whereby the part cylindrical portion surrounds the majority of the peripheral extent of the cylinder and two spaced flanges arranged at said longitudinal edges on respective sides of the opening and extending axially of the cylindrical portion and outwardly therefrom, said cylindrical portion and flanges being formed from a single sheet of rigid material such that the flanges are formed contiguously with and are bent outwardly from the cylindrical portion, said flanges extending substantially the full length of the cylindrical portion, and means for releasably clamping the cylindrical portion around the end of the cylinder such that a part of the cylindrical portion and flanges extends axially beyond the end of the cylinder, the spacing between the flanges and the outward extent thereof being sufficient to receive the regulator and gauge therein whereby the axially extending part of the cylindrical portion and flanges acts to protect the valve, gauge and regulator.

4,600,034

DEVICE FOR THE PERCEPTION OF GAS FLOW

Sung H. Ko, Anyang, Rep. of Korea, assignor to Il Kwang Co., Ltd., Kwang Ju, Rep. of Korea

Filed Aug. 16, 1984, Ser. No. 641,327

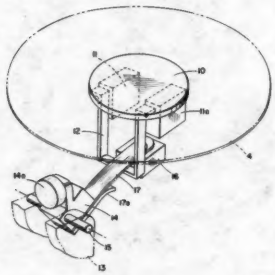
Claims priority, application Rep. of Korea, Sep. 24, 1983, 83-4479

Int. Cl.[4] F16K *37/00*

U.S. Cl. 137—554 **7 Claims**

1. A device for indicating that gas is flowing through an inlet pipe and an outlet pipe, the flow of gas being indicated by the lighting of an indicator lamp, said device comprising:

a housing;
a chamber defined by the housing;
a diaphragm spanning the chamber;
a first chamber portion defined on one side of the diaphragm;
a second chamber portion defined on the other side of the diaphragm, said inlet pipe and said outlet pipe communicating with the second chamber portion;
a first passage defined by the housing, the first passage communicating at one end with the outlet pipe and at the other end with the first chamber portion;
a second passage defined by the housing being in communication with the second chamber portion and the outlet pipe, said second passage having a diameter less than the diameter of said outlet pipe and the diameter of said first passage;
means for opening and closing said second passage, said means for opening and closing having a flexible arm with a first magnet at one end and a valve at the other end, said flexible arm being pivotally mounted in the second chamber portion for moving the valve into engagement with and away from the second passage;



means for moving the diaphragm in the chamber, said means for moving having a plate secured to the diaphragm, a second magnet and a third magnet mounted on the plate, said second magnet and said third magnet being spaced from one another to allow movement of the first magnet therebetween, and a U frame, said U frame having its legs mounted on the plate and having the flexible arm pass through the space defined by the U frame and the plate for the moving of the flexible arm by the crosspiece of the U frame upon leakage of gas from the outlet pipe; and
a lead-switch positioned outside of the chamber, the lead-switch being closed by the magnetic force of the first magnet when the first magnet contacts the chamber wall adjacent to the lead-switch thereby lighting the indicator lamp to indicate that the valve has moved away from the second passage to allow gas flow and the lead-switch being opened when the first magnet is drawn from the lead-switch thereby extinguishing the indicator lamp to indicate that the valve has pivoted on the flexible arm to close the second passage to stop gas flow.

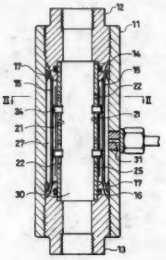
4,600,035

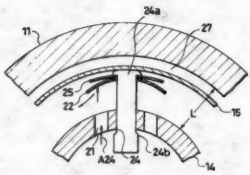
PULSATION ABSORBING DEVICE INCORPORATING AN INNER CYLINDER PROVIDED WITH SLIDABLE VALVE SHOES

Nobuyuki Sugimura, 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Aug. 29, 1985, Ser. No. 770,797
Int. Cl.[4] F16L *55/02*
U.S. Cl. 138—30 **4 Claims**

1. A pulsation absorbing device received in a cylindrical pressure vessel, which comprises:
a cylindrical resilient diaphragm; an inner cylinder formed with a plurality of communicating holes around its wall and provided with one or more slidably movable valve shoes, both of said diaphragm and the inner cylinder being disposed concentrical with each other; one or more arched leaf springs disposed along the outer face of the inner cylinder and at the place able to cover said commu-





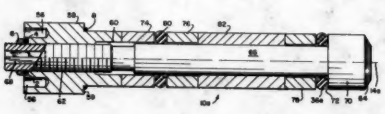
nicating holes, said springs being slidably coupled to said inne cylinder by a plurality of pins, the stroke of the slidable movement given to said pins being larger than the stroke of the spring motion of said leaf springs. ! /

4,600,036

MECHANICAL SEAL PLUGS FOR FLUID-SEALING OF TUBES

Renato R. Noe, Union City, N.J.

Continuation of Ser. No. 545,168, Oct. 25, 1983, Pat. No. 4,474,216. This application Sep. 6, 1984, Ser. No. 647,662
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 **9 Claims**



1. A plug, for fluid-sealing of tubes, comprising:
a plug body having a central, longitudinal axis;
said body having a threaded bore formed therein, axially;
a nosepiece;
said nosepiece having a shank portion which is externally threaded;
said shank portion being threadedly engaged with said bore; and
said nosepiece having means manipulatable for causing said nosepiece threadedly to extend from, and retract toward said body; wherein
said shank portion comprises a straight cylindrical area, parallel with said axis, and has a solid cross-section transverse to said axis; and further including
a seal set in frictional, encircling engagement with said area; and
annuluses slidably engaged with said shank portion; wherein

said seal is interpositioned between a pair of said annuluses; and further including

gripping means encircling said nosepiece, and movable relative thereto to effect fast, gripping engagement with an inner surface of a tube; wherein

said body, said nosepiece and said annuluses together comprise means which, in response to said nosepiece being threadedly retracted toward said body, are cooperative for (a) causing said gripping means to move, relative to said nosepiece, into fast, gripping engagement with an inner surface of a tube, and (b) causing said seal to (1) be compressed, (2) increase in outside diameter only, as a result of compression thereof, and (3) effect fluid-sealing engagement with an inner surface of a tube.

4,600,037

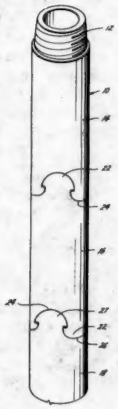
FLEXIBLE DRILL PIPE

James L. Hatten, Houston, Tex., assignor to Texas Eastern Drilling Systems, Inc., Houston, Tex.

Continuation of Ser. No. 590,789, Mar. 19, 1984, abandoned. This application Jul. 1, 1985, Ser. No. 750,184

Int. Cl.[4] D03D *21/00*

U.S. Cl. 138—120 **18 Claims**



1. A flexible pipe comprising:

an elongated tubular member subdivided into a plurality of segments of rigid pipe of substantial wall thickness in end-to-end relationship with a plurality of interlocking teeth and complementary recesses on each end of the segments intermediate the ends of said tubular member, the teeth of one segment being positioned in the recesses of, and interlocking the teeth of, the adjacent segment with sufficient clearance to form a joint permitting limited relative movement between the segments,

each of said teeth comprising an arcuate crown portion with its arc extending generally axially of said pipe, a tapered base portion and a substantially flat shoulder area extending between said crown and base portions in a direction generally circumferentially of said pipe.

4,600,038

ENGINE PART

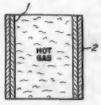
Minoru Matsui, and Takao Soma, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

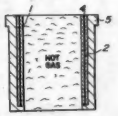
Filed Dec. 27, 1982, Ser. No. 452,969

Claims priority, application Japan, Oct. 25, 1982, 57-186071

Int. Cl.[4] F16L *9/14*

U.S. Cl. 138—140 **13 Claims**





1. An engine part comprising:

a plurality of ceramic members, a first ceramic member having a front surface and a back surface, said front surface contacting a hot gas; and

a second ceramic member having a front surface and a back surface, said front surface of said second ceramic member being fittingly secured to said back surface of said first ceramic member by a means for permitting relative sliding therebetween at an operative temperature of the engine part, wherein each of said first and second ceramic members have mechanical strengths of greater than 20 Kg/mm^2.

4,600,039

PROCESS AND DEVICE FOR THE FORMATION OF A TUCKED SELVEDGE, ESPECIALLY SUITABLE FOR TERRY LOOMS

Luciano Corain, Vicenza, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Filed Nov. 30, 1983, Ser. No. 556,641

Claims priority, application Italy, Dec. 23, 1982, 24966 A/82

Int. Cl.[4] D03D *47/48*

U.S. Cl. 139—434 **5 Claims**

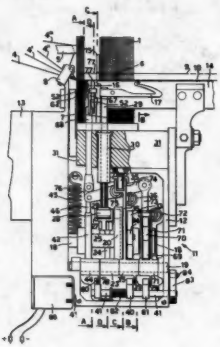
1. An apparatus for forming a tucked selvedge on a terry cloth fabric produced on a loom having an articulated reed with two beat-up positions in which a plurality of weft threads are inserted into successive warp sheds, comprising:

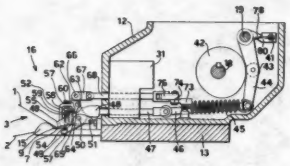
(a) moveable means for grasping and cutting said weft ends, said moveable means having both linear and rotational movement;

(b) means for slackening said weft threads while grasped by said moveable means;

(c) a moveable hook-like member having linear and rotational movement for receiving said cut weft ends from said grasping and cutting means and reintroducing said weft ends into a successive warp shed, wherein said grasping and cutting means and said hook-like member are driven independently of one another by discrete cams in cooperation with a plurality of spring-biased levers fulcrummed at either end to a common shaft, said levers being further provided with projections or teeth adapted to cooperate with corresponding stop abutments mounted on a spring biased arbor which is displaceable in a parallel and axial direction to said common shaft; and

(d) an electromagnet for engaging or disengaging said teeth of said levers with said corresponding stop abutment so as





to render said moveable grasping and cutting means motionless.

4,600,040

ARRANGEMENT IN APPARATUS FOR PREPARING SOLUTIONS FROM HARMFUL SUBSTANCES

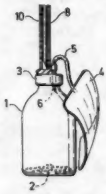
Jan I. Näslund, Vassvägen 21, S-141 39 Huddinge, Sweden

Filed Mar. 5, 1984, Ser. No. 586,547

Claims priority, application Sweden, Mar. 21, 1983, 8301517; Oct. 25, 1983, 8305867

Int. Cl.[4] A61M *5/00*

U.S. Cl. 141—18 **5 Claims**



1. In an apparatus for preventing unintentional escape of solutions made from such harmful substances as cytostaticum, toxic, radioactive and allergy-producing substances, the combination comprising:

(a) a first container means for containing said solutions, said first container means having an interior,

(b) first hermetically sealed means movable into and out of said first container means for withdrawing a solution therefrom, and

(c) an expandable second container means fluidly cooperating with said first container means to equalize pressure in said first container means, said first container means being exterior to said second container means, said second container means being hermetically sealed and said second container means having an interior in constant fluid communication with the interior of said first container means, the interior of said first container means and the interior of said second container means defining a closed system having a finite volume of air so that as solution is withdrawn from said first container means by said first hermetically sealed means air is drawn from said second container means into said first container means to equalize pressure in said first container means.

4,600,041

FUEL TANK WITH FILLING UP INDICATING DEVICE FOR VEHICLE

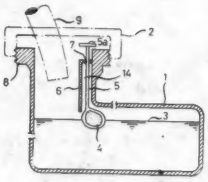
Hiroshi Nishida, Miki, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 31, 1985, Ser. No. 696,595

Claims priority, application Japan, Feb. 10, 1984, 59-17757[U]

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—95 **4 Claims**



1. A fuel tank for vehicles having a fuel supply port, a removable cap for said port, and a filling up indicating device comprising a float which can float on fuel stored in the tank, a stem which is attached to said float and extends upwards, an indicator connected to the top of said stem, and a support member which is installed inside said fuel supply port to support said stem and enable said stem to vertically slide,

wherein the improvement resides in that said stem is slidably supported near and along the inner surface of said fuel supply port; and

said stem and said indicator are held inside said cap when said supply port is closed by the cap.

4,600,042

OIL DISPENSING AND RECEIVING APPARATUS

Troy F. York, 204 S. Ohio St., and Arthur G. Dearing, P.O. Box 82, both of Greenville, Ohio 45331

Filed Sep. 12, 1984, Ser. No. 650,239

Int. Cl.[4] B65B *3/06*; F01M *11/04*

U.S. Cl. 141—98 **5 Claims**

1. An oil dispensing and receiving apparatus for use on a gas combustion engine comprising:

a tubular housing having generally cylindrical sidewalls and a flat bottom wall, said tubular housing being sized to receive a standard sized quart oil container;

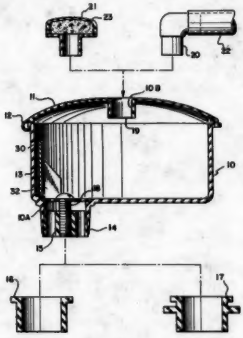
lid means for selectively closing said tubular housing;

a generally cylindrical oil outlet integrally formed into and extendng from the bottom wall of said tubular housing, said oil outlet being sized to be received within an oil inlet of said engine;

tapered wedge means defining oil passages therethrough and sized to be received within and drawn into said oil outlet after it has been inserted into said oil inlet to thereby permanently retain said oil dispensing and receiving apparatus on said engine; and

blade means secured to said bottom wall of said tubular

housing for opening an oil container inserted into said tubular housing whereby oil from the opened container



can pass into said engine through said oil outlet, said tapered wedge means and said oil inlet.

4,600,043

LOG SPLITTING APPARATUS

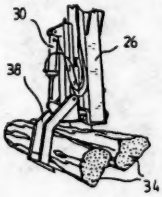
Vernon R. Chapman, Kakatahi R.D., Wanganui, New Zealand

Filed Nov. 13, 1984, Ser. No. 670,826

Claims priority, application New Zealand, Nov. 24, 1983, 206387

Int. Cl.[4] B27L *7/00*

U.S. Cl. 144—193 A **6 Claims**



1. A log splitting apparatus comprising:
a blade mounted at the distal end of an arm,
said arm being pivotally mounted at the end of a boom,
said boom being pivotally mountable on a frame,
means for pivoting said arm,
means for pivoting said boom,
said arm and said boom being pivotal about parallel axes,
said blade being pivotal at said distal end of the said arm about an axis substantially parallel to said parallel pivot axis of said boom and arm,
means for pivoting said blade,
a pivotal claw mounted at the end of the said arm on a pivot axis substantially perpendicular to the pivot axis of said boom and said arm,
and means for pivoting said claw,
the arrangement being such that in use when a log to be split is grasped between said side of said blade and said claw member and thereby aligned with longitudinal axis substantially perpendicular to said parallel pivotal axes and has one end against an immovable abutment, and the cutting edge of said blade is applied to the other end of said log and said arm and boom are pivoted to pull the blade towards the base of the boom into said log end, the log is split.

4,600,044

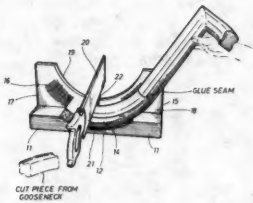
METHOD AND APPARATUS FOR JOINING STAIR RAIL FITTINGS TOGETHER

John M. Gray, Jr., 216 Riverview Dr., Marion, Va. 24354

Division of Ser. No. 525,915, Aug. 24, 1983. This application Apr. 22, 1985, Ser. No. 725,701

Int. Cl.[4] B27M *3/00*

U.S. Cl. 144—372 **4 Claims**



4. A process for accurately cutting a curve of stair rail fitting for an inclined stair rail, the process including the steps of
placing the stair rail fitting to be cut on base means having a curved bed formed integrally therein between and below two flat shoulders formed integrally of the base means so that the curved portion of the fitting rests on the curved bed, the curved bed conforming to the fitting's curve,
positioning the fitting on the curved bed by aligning the point on the fittings where the curved portion begins with a point on scale indicator means provided adjacent base means which point corresponds to the angle of incline of the rail, and
sawing through the fitting with saw means which are received as cutting proceeds in slot means provided in wall means connected to the base means.

4,600,045

PNEUMATIC VEHICLE TIRE

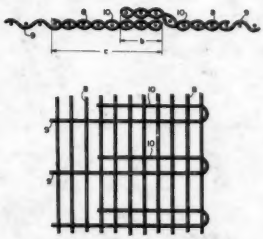
Karl-Heinz Dudziak, Garbsen, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,436

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312785

Int. Cl.[4] B60C *9/02, 9/11, 9/18, 9/28*

U.S. Cl. 152—526 **8 Claims**



1. In a pneumatic vehicle tire having a reinforcement at least one of a carcass and a belt wherein at least one of said carcass and said belt is comprised of sections which overlap one another by a predetermined amount and are made of a shot-in or picked cord fabric having wrap threads and woof threads, the improvement wherein ends of the woof threads are guided back into said overlapping sections of cord fabric by a distance which is sufficient to hold said ends in the structure of said cord fabric, with said distance further being in a range of

approximately three times to ten times greater than the amount by which two of said cord fabric sections overlap.

4,600,046

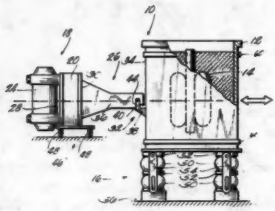
MOLDING APPARATUS AND PROCESS INCLUDING SAND COMPACTION SYSTEM

Frank V. Bailey, Racine; Robert T. Larsen, Three Lakes, and Russell J. VanRens, West Allis, all of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 568,051, Jan. 4, 1984, abandoned. This application Nov. 15, 1984, Ser. No. 671,629

Int. Cl.[4] B22C *9/04, 15/10*

U.S. Cl. 164—34 **64 Claims**



1. A process for compacting sand around a mold pattern in a rigid mold flask for casting, the mold flask, when containing sand, having a combined center of gravity, said process comprising the steps of: resiliently supporting the rigid mold flask for horizontal movement only of the mold flask as a whole body, and shaking the mold flask to provide horizontal vibrational forces directed in a horizontal plane extending approximately through the combined center of gravity of the mold flask and the sand.

9. A molding apparatus comprising a rigid mold flask having a bottom and adapted to contain a mold pattern and sand, means for resiliently supporting said mold flask for horizontal movement only of said mold flask as a whole body, and means for shaking said mold flask to provide horizontal vibrational forces having a resultant force directed in a horizontal plane spaced above said flask bottom.

4,600,047

PROCESS FOR CONTROLLING THE MOLTEN METAL LEVEL IN CONTINUOUS THIN SLAB CASTING

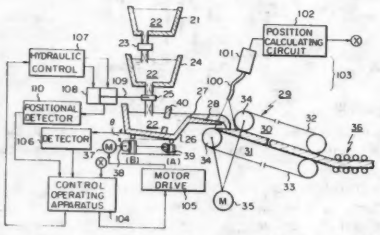
Yoshiyuki Matoba, Kawanishi; Yoshisuke Misaka, Takarazuka; Yasutake Ohhashi, Nishinomiya; Tsutomu Takamoto, Minoo, and Yutaka Hirata, Saga, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1985, Ser. No. 701,671

Claims priority, application Japan, Mar. 29, 1984, 59-59489; Mar. 29, 1984, 59-59490; Mar. 29, 1984, 59-59491

Int. Cl.[4] B22D *11/20, 11/18*

U.S. Cl. 164—453 **7 Claims**



1. A process for controlling the molten metal level in continuous thin slab casting in which molten metal poured from a large-sized tundish into a small-sized tundish through a sliding nozzle is caused to overflow from the small-sized tundish for casting through a tiltable casting spout into a twin-belt-type continuous casting machine, comprising the steps of:

measuring the level of molten metal on said twin-belt-type continuous casting machine;

comparing the said measured melt level with a target melt level to provide a melt level deviation signal; and

adjusting the angle of inclination of said tiltable casting spout relative to the horizontal according to said melt level deviation signal to regulate the rate at which molten metal is poured from said small-sized tundish into said twin-belt-type continuous casting machine, whereby the level of the molten metal is controlled so as to achieve the target level with high accuracy.

4,600,048

METHOD FOR CONTINUOUS CASTING OF METAL STRIP

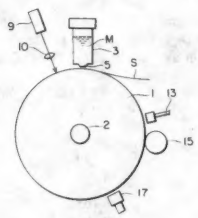
Takashi Sato; Tsutomu Ozawa, and Katsuhiro Minamida, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 12, 1985, Ser. No. 764,780

Claims priority, application Japan, Aug. 13, 1984, 59-167910

Int. Cl.[4] B22D *11/06, 27/04*

U.S. Cl. 164—463 **5 Claims**



1. In a method for casting a thin strip of metal directly from a molten metal by jetting the molten metal through a nozzle onto the surface of a moving chill body, quenching and solidifying the molten metal, an improved method which comprises the step of irradiating a high density energy beam onto the surface of said chill body at a region to the rear of said nozzle during said casting in order to rapidly heat only the surface of the chill body.

4,600,049

METHOD AND SYSTEM FOR OPERATING A COOLING PLANT

Vilgot Nilsson, deceased, late of Hägersten, Sweden (Mary Nilsson, Goran Nilsson, heirs), assignor to Alfa-Laval Marine and Power Engineering AB, Tumba, Sweden

Filed Apr. 10, 1984, Ser. No. 598,737

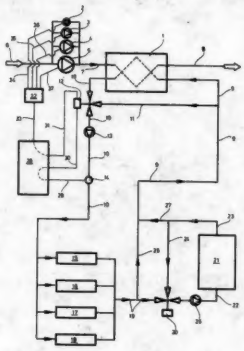
Claims priority, application Sweden, Apr. 12, 1983, 8302002

Int. Cl.[4] G05D *23/13*

U.S. Cl. 165—1 **7 Claims**

1. In the operation of a cooling plant comprising a heat exchanger having a primary side for receiving a first flow of primary coolant and having a secondary side for receiving a second flow of secondary coolant, a group of devices having a variable cooling demand, circulating means including an outlet conduit for delivering coolant from said secondary side to said group and an inlet conduit for returning coolant to said secondary side from said group, a by-pass conduit for flow of coolant from said inlet conduit to said outlet conduit while by-passing said secondary side, a device for sensing changes in said cooling demand, valve means operable under control of the sensing device to increase said second flow while decreasing said

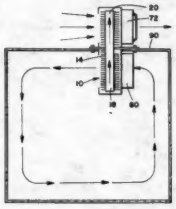
by-pass flow, in response to an increase in said demand, and to decrease said second flow while increasing said by-pass flow in response to a decrease in said demand, and pumping means having a stepwise adjustable capacity for pumping primary coolant through said primary side, the method which comprises operating said pumping means at a predetermined capacity while flowing secondary coolant through said circulating means and said by-pass conduit, increasing said capacity in response to said by-pass flow decreasing to a predetermined low rate, and decreasing said capacity in response to said by-pass flow increasing to a predetermined high rate.



4,600,050
HEAT EXCHANGER

Don W. Noren, 846 Blandford Blvd., Redwood City, Calif. 94062

Filed Apr. 26, 1985, Ser. No. 727,588
Int. Cl.[4] F28D 15/00
U.S. Cl. 165—104.14 14 Claims



1. A heat exchanger assembly for cooling the interior of a closed cabinet containing electronic components or the like, comprising:

a finned heat pipe core including:

a plurality of spaced heat pipes positioned in at least one row,

a plurality of spaced fins which are provided with colinear apertures through which each of said plurality of heat pipes can extend, said heat pipes being secured to said fins;

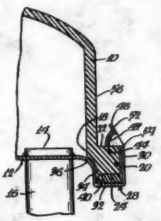
affixing means for securing said finned heat pipe core to an associated cabinet; and,

a pair of fans, one being operatively connected with each end of said finned heat pipe core, one of said fans, and an associated first end of said heat pipe core, being in contact with only the air inside said associated closed cabinet, the other of said fans and an associated second end of said finned heat pipe core being in contact with only the ambient air outside said associated cabinet, and wherein said fins have a spacing and a thickness which is sized to fit the performance curve of said fans wherein said fans each have a capacity of approximately 100 CFM (cubic feet per minute) and wherein said finned heat pipe core is optimized for said fans such that approximately fourteen fins are provided per inch of heat pipe length with each of said fins being approximately 0.008 inches in thickness, whereby said finned heat pipe core and said pair of fans are capable of transferring at least 200 watts of heat when the temperature inside said associated cabinet is approximately 20° C. above the ambient temperature.

4,600,051
TANK-HEADER PLATE CONNECTION

James L. Wehrman, Kenosha, Wis., assignor to Modine Manufacturing, Racine, Wis.

Filed Jul. 13, 1984, Ser. No. 631,893
Int. Cl.[4] F28F 9/02
U.S. Cl. 165—149 7 Claims



1. A connection for securing a tank to a header plate in a heat exchanger comprising:

a metal header plate supporting the open ends of a plurality of tubes;

a groove extending about the periphery of said header plate and having a bottom wall surrounded by an upstanding, deformable side wall terminating in an edge;

a compressible gasket in said groove;

a plastic tank having an opening surrounded by an outwardly extending flange, said flange being sized and configured to be fitted within said groove with one side of the flange abutting said gasket and the opposite side of the flange within the groove and spaced from said edge, said tank compressing said gasket so that said gasket effects a seal between said tank and said header plate; and

a plurality of tabs in said side wall below said edge and overlying said opposite side to hold said tank in compressing relation to said gasket, each said tab being formed by deformation and piercing of said side wall to having a generally curved nominally planar, free edge in contact with said opposite side of said flange and tapering from said free edge toward said side wall edge to merge into said side wall prior to or at said side wall edge;

said side wall, in the area of said tabs merging into said side wall and in the area above said free edges, being deformed toward said tank to at least partially overlie said flange and to assure abutment of said free edges with said flange.

4,600,052
COMPACT HEAT EXCHANGER

Charles D. Wood, III, San Antonio, and Harvey S. Benson, Mico, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

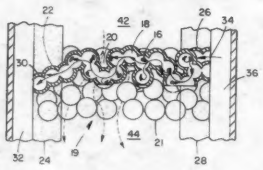
Filed Mar. 2, 1984, Ser. No. 585,500
Int. Cl.[4] F28F 7/00
U.S. Cl. 165—165 9 Claims

1. A compact heat exchanger apparatus comprising:

a cluster of hollow shells, each said shell having an outer surface and an inner surface, said shells being clustered to connect portions of their said outer surfaces with portions

of said outer surfaces of adjacent said shells to form a substantially contiguous interstitial space between the unconnected portions of said outer surfaces, said inner surfaces forming cavities which are interconnected by inner passages through said connecting portions of said shells' outer surfaces to cavities in adjacent said shells, at least some of said cavities and inner passages comprising a contiguous inner space within said inner surfaces of said cluster, fluid communication between said interstitial space and said inner space being prevented by said shells;

a first side of said cluster bonded to a first bonding layer which seals said interstitial space on said first side of said cluster, said first side of said cluster being open to the exterior side of said first bonding layer to make said inner space accessible to a first manifold connected to said exterior side of said first bonding layer;



a second side of said cluster bonded to a second bonding layer which seals said interstitial space on said second side of said cluster, said second side of said cluster being open to the exterior side of said second bonding layer to make said inner space accessible to a second manifold connected to said exterior side of said second bonding layer;

said cluster being permeable to a first fluid flowing from said first manifold through said inner space to said second manifold and permeable to a second fluid flowing from a third side of said cluster through said interstitial space to a fourth side of said cluster without mixing said first fluid with said second fluid; and

said apparatus being useable to exchange heat between a flowing said first fluid and a flowing said second fluid.

4,600,053

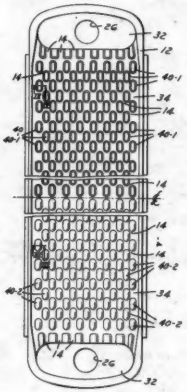
HEAT EXCHANGER STRUCTURE

Ramchandra L. Patel, Southgate, and Chhotubhai N. Patel, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1984, Ser. No. 674,385
Int. Cl.[4] F28F 3/14; F28D 1/02
U.S. Cl. 165—170 **1 Claim**

1. In a heat exchanger of the type wherein a plurality of elongated plates are laminated together to define a plurality of passageways for movement of fluid therethrough, each of said passageways being formed by inwardly facing surfaces of a pair of laminated plates which define a central fluid conducting section located between reservoir sections at each end thereof, wherein adjacent of said passageways are so constructed and arranged that heat conductive fin strips are located between juxtaposed, outward facing surfaces thereof; and wherein reservoirs of adjacent ones of said passageways are interconnected so that the fluid may flow through said plurality of laminated plates forming the heat exchanger, the improvement to said laminated plates which comprises:

a plurality of beads formed in each of the pair of laminated plates forming one of said passageways, said beads formed on each of said laminated plates being of at least two distinct varieties, a first variety of said beads extending above a surface of each laminated plate and terminating in a relatively flat upper surface, and a second of said variety of said beads extending above a surface of each laminated plate and terminating in a bowed upper surface, said plurality of said first variety of said beads being on one side of a center line of each of said laminated plates and said second variety of said beads being on the other side of said center line of each of said pair of laminated plates wherein each of said laminated plates is of identical design and wherein said first and said second variety of beads on facing plates are laminated together said first variey of beads on one of said elongated plates are bonded directly



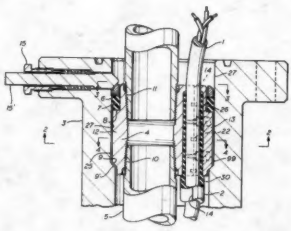
to said second variety of beads on said other of said pair of laminated plates and vice-versa, whereby said heat exchanger has a plurality of flow paths established for the fluid in each of said passageways and whereby the overall strength of the heat exchanger is improved and only one type of plate is used to form the heat exchanger.

4,600,054

TUBING HANGER ASSEMBLY

Jim Miller, Tomball; Jim Humphries, Houston, and Toby Teel, Humble, all of Tex., assignors to Equipment Renewal Company, Houston, Tex.

Filed Mar. 30, 1984, Ser. No. 595,552
Int. Cl.[4] E21B 33/03
U.S. Cl. 166—75.1 **2 Claims**



1. A tubing hanger assembly for use in a wellhead flange for a production oil well where it is desired to pass an electrical cable through the tubing hanger assembly, said tubing hanger assembly including:

a cylindrically formed tubing hanger member having diametrically stepped outer surfaces for defining a downwardly facing landing seat adapted for engagement with an upwardly facing landing surface in a wellhead flange, said tubing hanger member having a central axis, said tubing hanger member being constructed of at least two sector parts which have facing vertical surfaces disposed to one side of said central axis and perpendicular to said

central axis so as to form a large sector part including the central axis and a small sector part,

means for interconnecting said sector parts to one another with said vertical surfaces in contact with one another,

sealing means disposed transversely to said central axis when interconnected for pressure sealing of said vertical surfaces relative to one another above and below said interconnecting means,

said interconnected sector parts defining a vertical bore with its axis along the said facing vertical surfaces and parallel to said central axis, said bore having a smaller diameter bore opening at the upper horrizontal surface of the tubing hanger member and a lower larger diameter bore opening at the lower horrizontal surface of the tubing hanger member, said smaller diameter bore opening being sized to the diameter of an electrical cable to be used with the tubing hanger member and said larger diameter bore opening being sized to receive a tubular sealing means, sealing means in said larger diameter bore opening for providing a sealing relationship between the larger diameter bore opening and an electrical cable,

said tubing hanger member having upper diametrically stepped outer surfaces for receiving an annular sealing means,

annular sealing means on said tubing hanger member at said upper diametrically stepped outer surfaces,

annular compression ring means disposed above said annular sealing means for compressing said annular sealing means into a sealing relationship between said tubing hanger member and a well flange, and

said large sector part having at least one production threaded bore adapted for receiving threaded ends of tubing.

4,600,055

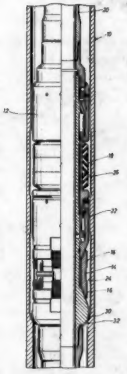
TUBULAR WELL TOOL RECEIVING CONDUIT

Douglas G. Durst, Pearland, and Arthur J. Morris, Magnolia, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Jun. 24, 1985, Ser. No. 747,582

Int. Cl.[4] E21B *23/06*

U.S. Cl. 166—115 **5 Claims**



1. In combination, a well packer and a tubular well tool receiving conduit comprising,

a well packer having an expandable and retractable anchoring teeth and an expandable and retractable seal spaced from said anchoring teeth,

a tubular well conduit including,

a first plurality of circularly extending grooves on the inside of the conduit for coacting with the anchoring teeth for supporting the well tool in the conduit,

a second plurality of circularly extending grooves on the inside of the conduit and positioned for coacting with the expandable seal for providing multiple seal points with the seal.

4,600,056

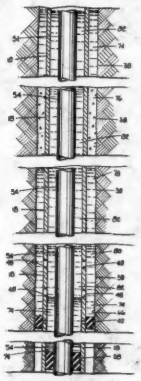
METHOD AND APPARATUS FOR COMPLETING WELL

Guy C. Burton, Jr., Casper, Wyo., assignor to Rejane M. Burton, Casper, Wyo., a part interest

Continuation-in-part of Ser. No. 593,394, Mar. 26, 1984. This application Feb. 4, 1985, Ser. No. 698,130

Int. Cl.[4] E21B *33/16, 33/122*

U.S. Cl. 166—291 **11 Claims**



1. In a well having tubing extending downwardly into a well hole and with a casing surrounding the tubing so as to form a first annulus and a well hole surrounding at least a portion of said casing to form a second annulus; a seal between the tubing and casing; an external packer capable of being expanded located a predetermined distance above said seal and when in expanded condition forming a seal between said casing and said well hole; and a plurality of passageways through said casing filled by a material that may be forced out under pressure located a predetermined distance above said external packer, a method comprising:

flowing a first fluid through said annulus between said casing and said tubing;

blocking the flow of said first fluid by said seal between said casing and said tubing; and

continuing the flow of said first fluid until the pressure in said first annulus is sufficient to expand said external packer to form a seal between said casing and the surrounding wall of said well hole.

4,600,057

METHOD OF REDUCING THE PERMEABILITY OF A SUBTERRANEAN FORMATION

John K. Borchardt, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 23, 1984, Ser. No. 663,803

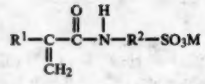
Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—295 **20 Claims**

1. A method of recovering fluid hydrocarbons from a subterranean formation having a temperature of at least 160° F. and which is penetrated by at least one well bore and for reducing the production of water therefrom comprising:

contacting said formation with an aqueous polymerizable composition comprising:

(a) a polymerization monomer selected from the group consisting of:



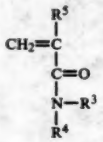
I.

wherein

R^1 is selected from the group consisting of hydrogen and methyl;

R^2 is selected from the group consisting of an alkylene group having 1 to about 4 carbon atoms; and,

M is selected from the group consisting of hydrogen, ammonium, and an alkali metal;



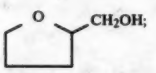
II.

wherein

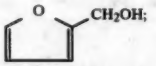
R^3, R^4, and R^5 are independently selected from the group consisting of hydrogen and methyl; and, mixtures of I and II;

(b) a polymerization catalyst having a latent period; and,

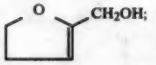
(c) an alcoholic compound present in an amount of from about 0.01 to about 10 percent by weight of said monomer and selected from the group consisting of:



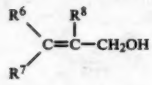
III.



IV.



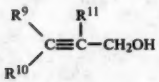
V.



VI.

wherein:

R^6, R^7, and R^8 are independently selected from the group consisting of hydrogen and methyl;



VII.

wherein

R^9, R^{10}, and R^{11} are independently selected from the group consisting of hydrogen and methyl; and, mixtures of III, IV, V, VI, and VII.

4,600,058

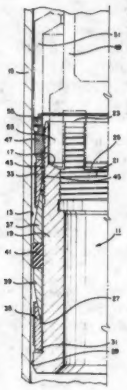
EQUIPMENT INSERT AND METHOD

Richard A. Van Wormer; John L. Baugh; Charles Ledet, all of Huntsville, and Malcolm Roach, Houston, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Feb. 19, 1985, Ser. No. 702,964

Int. Cl.[4] E21B *23/06, 33/128*

U.S. Cl. 166—382 **6 Claims**



1. A method of installing an equipment insert into the interior bore of a section of well pipe at the well surface prior to making up the section of pipe into a well pipe string, the well pipe being of the type having threaded surfaces at the opposite ends thereof for engaging mating threaded surfaces of the adjoining pipes in the well pipe string and having a cylindrical interior bore, comprising the steps of:

running an equipment insert into the section of well pipe at the well surface, the equipment insert being connected to a hand operated setting tool;

providing gripping means on the exterior of the equipment insert for gripping the cylindrical interior bore of the section of well pipe and providing sealing means on the exterior of the equipment insert for forming a seal between the exterior of the equipment insert and the cylindrical interior bore of the section of well pipe;

manipulating the hand operated setting tool at the well surface to actuate the gripping means and sealing means to grip the pipe interior bore and to form a seal with the interior bore of the section of well pipe;

making up the section of well pipe containing the equipment insert into the well pipe string; and

running the well pipe string into the well bore and conducting well bore operations.

4,600,059

LINE MOVING APPARATUS FOR WIRELINE SUPPORTED TOOLS

Joe E. Eggleston, Missouri City, and David R. Warren, Manvel, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 4, 1985, Ser. No. 697,655

Int. Cl.[4] E21B *41/00, 47/00, 19/02*

U.S. Cl. 166—385 **10 Claims**

1. Open hole well servicing equipment, comprising:

(a) an elongate wireline;

(b) means for raising and lowering the elongate wireline in an open hole;

(c) a tool adapted to perform downhole services when suspended in an open hole; and

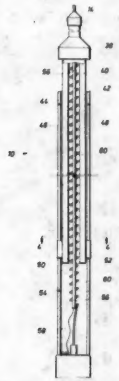
(d) means connected between said wireline and said tool enabling relative movement of said wireline connected to

said means through a specified stroke, said means enabling said tool to sustain a specified elevation within an open hole while said means for raising said wireline operates to reciprocate said wireline.

5. A method of operating an well tool in an open hole well comprising the steps of:

(a) lowering a tool into a well on a wireline;

(b) conducting below ground well operations with said tool set at a specified elevation;



(c) while the prior step is being conducted, reciprocating the wireline up and down from the top of the well to keep the wireline in continuous motion; and

(d) wherein the last step is conducted substantially along the entire length of the wireline including enabling the lower end of the wireline to move as a result of reciprocation of the wireline by means connected between said wireline and said tool at the lower end of said wireline, said means having a specified stroke and enabling said tool to sustain a specified elevation in the borehole while said means operates to allow reciprocal motion of said wireline.

4,600,060

DEPTH SENSING STRUCTURE FOR AN AGRICULTURAL IMPLEMENT

David C. Winter, Des Moines, and John D. Long, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 28, 1983, Ser. No. 546,621

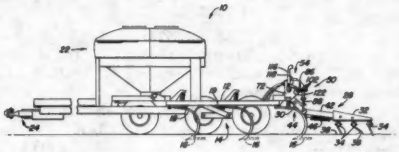
Int. Cl.[4] A01B *63/114*

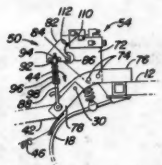
U.S. Cl. 172—4 **24 Claims**

20. In an agricultural implement having a transversely extending main frame, ground-working tools supported by the frame, and activatable lift means for raising and lowering the frame with respect to the ground to adjust the depth of penetration of the tools, depth-control structure comprising:

a ground-contacting member connected to the main frame for movement vertically with respect to the main frame as the depth of penetration changes; and

means responsive to the vertical movement of the ground-contacting member and operably connected to the lift means for actuating the lift means to maintain the depth of penetration of the tools within a preselected range, said means responsive comprising a rotating member having an axis of rotation and a lift means operating portion offset from the axis of rotation, means for pivoting the rotating member about the axis as the ground-contacting member moves vertically including a connecting member extending between the ground-contacting member and the rotating member, means for adjusting the sensitivity of the means responsive to the vertical movement including means attaching the connecting member to the rotating member at varying radial distances from the rotational





axis, and means for changing the location of the operating portion relative to the lift means.

4,600,061

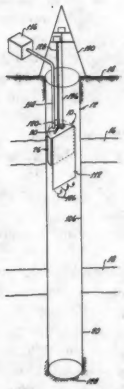
IN-SHAFT DRILLING METHOD FOR RECOVERY OF GAS FROM SUBTERRANEAN FORMATIONS

Walter L. Richards, Huntington Beach, Calif., assignor to Methane Drainage Ventures, Placentia, Calif.

Filed Jun. 8, 1984, Ser. No. 618,473

Int. Cl.[4] E21B *7/00;* **E21D** *10/00;* **E21C** *37/00*

U.S. Cl. 175—62 **11 Claims**



1. A method for collecting gas from subterranean formations having a plurality of spaced-apart seams containing said gas, said method comprising the steps of:

drilling a shaft from the earth's surface to a depth sufficient to intersect a plurality of seams containing gas to be collected;

lowering a platform supporting men and equipment within the shaft to a position adjacent a seam containing said gas;

drilling a plurality of boreholes from the shaft into a plurality of selected seams, at least two of the selected seams having a thickness of less than about three feet;

circulating fresh air to said platform using the shaft as a conduit; and,

collecting gas from said boreholes and conducting said gas throgh the shaft to the earth's surface.

4,600,062

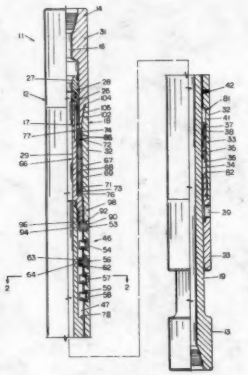
SHOCK ABSORBING DRILLING TOOL

Chuan C. Teng, Houston, Tex., assignor to 501 Dailey Petroleum Services Corporation, Conroe, Tex.

Filed Jul. 13, 1984, Ser. No. 630,777

Int. Cl.[4] E21B *17/07*; F16D *3/06*

U.S. Cl. 175—322 **12 Claims**



1. A shock absorber for a drill string comprising:

an elongated body having threaded connections at its ends for assembly into a string of well pipe carrying a drill bit, said body having an axial flow passageway;

said body formed of a tubular mandrel slideably mounted within a tubular barrel with an annulus exposed to well fluid between said mandrel and said barrel;

fluid seals positioned in the annulus between said mandrel and said barrel forming an annular region isolated from well fluid;

said mandrel and said barrel each having opposed shoulders defining a cylindrical chamber in the fluid isolated annular region;

bearing means for providing telescoping movements of said mandrel in said barrel;

a plurality of grooves extending longitudinally on said mandrel;

rollers carried by said barrel and driveably engaged within said grooves whereby said mandrel telescopes with respect to said barrel;

annular resilient shock absorbing members contained as a stack in said cylindrical chamber; and

said mandrel including at least two sections threadedly connected at a joint located between said rollers and said shock absorbing members.

4,600,063

DOUBLE-TAPER SLIP-ON DRILL STRING STABILIZER

Thomas R. Beasley, Houston, Tex., assignor to Dailey Petroleum Services Corp., Houston, Tex.

Filed May 29, 1984, Ser. No. 614,474

Int. Cl.[4] E21B *17/10*

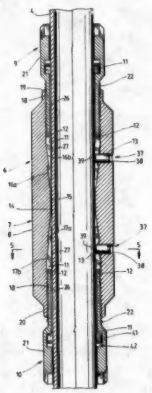
U.S. Cl. 175—325 **14 Claims**

1. A stabilizer for use on a drill collar which comprises:

(a) a cylindrical body with: (i) a longitudinal bore, (ii) internally threaded end portions, (iii) a double-tapered inner surface extending between each said end portion and a relatively thicker central portion;

(b) a hollow end cap at each end of said body threaded externally to mate with the corresponding internally threaded portion of said body and having a circumferential groove in the internal surface thereof near the outboard end thereof;

(c) a plurality of double-tapered slip segments within each end of said body adapted to mate and wedge against the double-tapered inner surface at said end of said body upon entry of one of said end caps into said end of said body; said slip segments being distributed around said body, each said slip segment having: (i) a longitudinal slot, and (ii) a circumferential recess in the exterior surface thereof near the outboard end of said slip segment facing said end cap, said circumferential recess defining a retaining lip on the external surface of said slip segment which fits within said circumferential groove in said end cap;



(d) an expansible member configured to engage the inner surfaces of said slip segments as to urge the lips of said slip segments radially into said circumferential recess of said end cap;

(e) a compressible renitent member positioned within said slip segment recess between the threaded terminus of said end cap and said slip segment so as to be compressed upon entry of said end cap into said body; and

(f) a locking device interengaging the said slip segment longitudinal slot and said body to resist rotational movement therebetween.

4,600,064

EARTH BORING BIT WITH BEARING SLEEVE

Stanley R. Scales; Duane E. Shotwell, both of Houston, and Gerald O. Atkinson, Pasadena, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Feb. 25, 1985, Ser. No. 705,158

Int. Cl.[4] E21B *10/20*

U.S. Cl. 175—368 **10 Claims**

1. an earth boring bit having an improved bearing sleeve and cutter retention means which comprises:

a bit body which includes at least one leg and a cantilevered bearing lug that extends downwardly and inwardly;

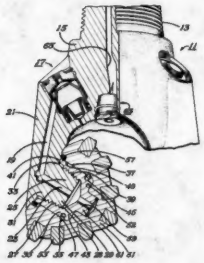
a thread formed on the bearing lug, tapered to diverge outwardly from an inner, end region to an outer, base region having a transverse shoulder;

a bearing sleeve with a substantially cylindrical bearing surface secured to the bearing lug, having a mouth at one end and a threaded portion, the mouth engaging respectively the transverse shoulder;

the bearing sleeve having a length greater than that of its threaded portion to define a thick walled end region;

a rotatable cutter with a cylindrical bearing surface assembled on the bearing sleeve;

an assembly groove formed on the cylindrical surface of the



bearing sleeve and in the thick walled end region at a location removed from the thread of the bearing lug and threaded portion of the bearing sleeve;

a mating, retainer groove formed in the rotatable cutter;

a resilient snap ring positioned in the mating assembly and retainer grooves to retain the cutter on the bearing shaft.

4,600,065

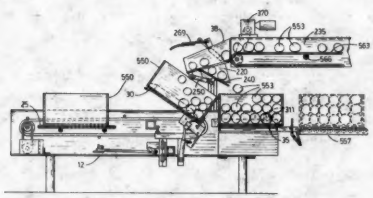
APPARATUS FOR FILLING CONTAINERS WITH PRIMARY AND SECONDARY SUPPLY CHUTES

Billy J. Morris, Visalia, Calif., assignor to Industrial Manufacturers of Orosi, Orosi, Calif.

Filed Jan. 7, 1985, Ser. No. 689,172

Int. Cl.[4] G01G *13/00, 13/02*

U.S. Cl. 177—123 **19 Claims**



1. An apparatus for filling containers with a predetermined weight of articles delivered to the apparatus from an article source comprising a frame; a first station borne by the frame for receiving unfilled containers from a container source; a second station borne by the frame adapted to support an unfilled container for the deposit of articles in the container; a third station borne by the frame adapted to support a partially-filled container for the deposit of articles in the container; a chute assembly adapted to direct a stream of articles toward a container supported on the second station, an article diverting assembly having a primary chute portion adapted to receive a stream of articles from the source of articles, the primary chute portion being operable to direct articles to a container supported on the second station, and providing a secondary chute operable to divert articles from the stream of articles in the primary chute to a container supported on the third station; and control means interconnecting the delivery means and the article diverting assembly for causing the operation and the cessation of operation of the primary chute portion and secondary chute when containers are supported on the second and third stations.

4,600,066

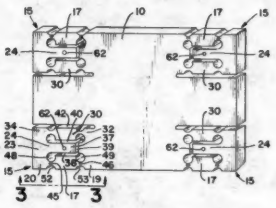
LOAD CELL APPARATUS

Neil C. Griffen, Columbus, and Stephen A. Patoray, Dublin, both of Ohio, assignors to Reliance Electric Company, Cleveland, Ohio

Continuation of Ser. No. 496,053, May 19, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 695,416

Int. Cl.[4] G01G *3/14, 3/08*

U.S. Cl. 177—211 **12 Claims**



1. Weighing apparatus comprising a base plate, foot means connected to said base plate, a transducer plate having a plurality of force transducer means formed integrally therein, each transducer means comprising first and second flexure beams and a support member formed in said transducer plate, said support member having a free end and having another end merging with an end of each beam, each beam having its other end merging with said transducer plate, strain sensing means on said first beam, said first and second flexure beams and support member being formed by a first slot in said transducer plate, a second slot in said transducer plate parallel to and spaced from said first slot, a third slot in said transducer plate at an angle to said first and second slots and connecting with at least one of said first and second slots, a fourth slot in said transducer plate, and force transmitting means between each of said support members and said base plate, said force transmitting means including a first cup connected to said support member, a second cup connected to said base plate and a ball adapted to fit between said first and second cups to permit limited relative movement of said cups in a direction parallel to the plane of said support member.

4,600,067

WEIGHING APPARATUS WITH ADDITIONAL ASSEMBLY FOR TORSION COMPENSATION

Francis Artigue, 21, chemin des Justices, F-91370 Verrieres le Buisson; Roland Cormier, 40, avenue Herbillon, F-94260 Saint Mande, and Christian Francois, 96, rue de Tolbiac, F-75013 Paris, all of France

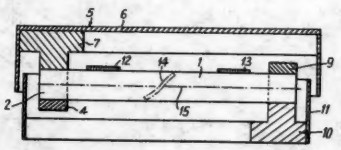
PCT No. PCT/FR83/00238, § 371 Date Jul. 30, 1984, § 102(e) Date Jul. 30, 1984, PCT Pub. No. WO84/02186, PCT Pub. Date Jun. 7, 1984

PCT Filed Nov. 29, 1983, Ser. No. 635,744

Claims priority, application France, Nov. 30, 1982, 82 20040

Int. Cl.[4] G01G *3/14, 3/08, 23/10*

U.S. Cl. 177—211 **32 Claims**



1. A weight measuring apparatus comprising:

a support base;

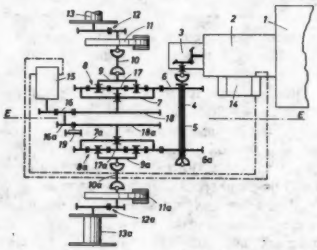
a load receiving plate;
a single bar including opposite ends, one end being connected to said load receiving plate, and the opposite end being connected on said support base;
at least two first strain gauge means fastened to the bar for producing a first signal corresponding to bending of the bar due to an applied load;
at least one second strain gauge means fastened to the bar for producing a second signal corresponding to twisting of the bar due to the applied load; and
means for combining the first and second signals produced by said first and second strain gauge means to eliminate a component of said first signal resulting from deformation of the bar due to torsion.

4,600,068

VEHICLE

Hugo Lenhard-Backhaus, Bruck an der Mur, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Jul. 17, 1985, Ser. No. 755,848
Claims priority, application Austria, Jul. 30, 1984, 2455/84
Int. Cl.[4] B62D *11/08*
U.S. Cl. 180—6.44 **5 Claims**



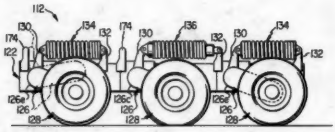
1. In a vehicle having a vertical longitudinal center plane and comprising
two propelling wheels disposed on opposite sides of said center plane and
a driving and steering mechanism including
a drive motor having a motor shaft which is parallel to and laterally spaced from said center plane,
a power train including an angle drive and a universal-joint shaft,
a shiftable transmission for transmitting torque from said motor to said power train,
two planetary spur gear trains for transmitting torque from said power train to respective ones of said propelling wheels, each of said planetary gear trains comprising three gear members, and
a controllable hydrostatic transmission including a rotary hydraulic motor connected to a first of said gear members of each of said planetary spur gear trains and operable to rotate said first gear members in mutually opposite senses, and a pump adapted to be driven by said drive motor and to operate said rotary hydraulic motor,
said shiftable transmission and said angle drive are axially aligned with said motor shaft,
said shiftable transmission is directly connected to said motor shaft and to said angle drive,
said universal-joint shaft extends transversely to said motor shaft and is surrounded by a tubular shaft and is non-rotatably connected at one end to said angle drive and at the other end to said tubular shaft,
said tubular shaft is non-rotatably connected to two gears, each of which is in mesh with one of said gear members of one of said planetary spur gear trains, and
said shiftable transmission comprises an auxiliary shaft directly connected to said pump.

4,600,069

TRAILING ARM SUSPENSION

Norman D. Oswald, Duncanville; Carl M. Franklin, Midlothian; Marc H. Gutzler, Duncanville, and Harry S. Mankey, Dallas, all of Tex., assignors to Standard Manufacturing Company, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 506,403, Jun. 21, 1983, which is a continuation-in-part of Ser. No. 426,218, Sep. 28, 1982, Pat. No. 4,454,925. This application May 14, 1984, Ser. No. 609,887
Int. Cl.[4] B62D *61/10*
U.S. Cl. 180—24.02 **18 Claims**



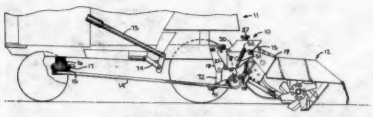
1. An undercarriage comprising:
an elongated hollow load bearing primary frame;
at least three secondary frames;
means supporting the secondary frames at longitudinally spaced points on the primary frame for pivotal movement with respect thereto;
at least three primary axles having a first portion positioned within the primary frame and a second portion positioned within one of the secondary frames;
means supporting each of the primary axles for rotation both with respect to the primary frame and with respect to its associated secondary frame;
primary transmission means positioned within the primary frame for drivingly interconnecting at least two of the primary axles;
drive means operably connected to the primary transmission means for actuation thereof whereby the drive means and the primary transmission means effect concurrent rotation of the interconnected primary axles;
a plurality of secondary axles each individual to one of the secondary frames and each having a wheel receiving member at one end thereof;
at least three wheel members each mounted on and secured to the wheel receiving end of one of the secondary axles;
means rotatably supporting the secondary axles in the secondary frames with each of the secondary axles extending out of its secondary frame and being rotatably supported in at least one side of its secondary frame;
at least two secondary transmission means each mounted in one of the secondary frames and each drivingly interconnecting one of the primary axles and its associated secondary axle; and
a spring and hydraulic cylinder assembly connected between each of the secondary frames and the primary frame for controlling and limiting pivotal movement of the secondary frames relative to the primary frame, for selectively positioning the wheel member mounted on the secondary frames to facilitate skid steering, for selectively positioning the wheel members mounted on the secondary frames to facilitate high speed operation, and for vertically extending and retracting all of the wheel members relative to the primary frame to facilitate operation when loaded and unloaded and to vertically position the undercarriage with respect to an underlying surface.

4,600,070

MODULAR TILLER HITCH FOR A LAWN AND GARDEN TRACTOR

Gary H. Thurner, Port Washington, Wis., assignor to Bolens Corporation, Port Washington, Wis.

Filed Jul. 31, 1984, Ser. No. 636,402
Int. Cl.[4] A01B *33/08, 33/02;* B60K *25/02*
U.S. Cl. 180—53.7 10 Claims



1. A hitch unit for coupling a belt-driven, ground engaging implement to a motorized vehicle and for taking up slack in a looped drive belt that is adapted to be installed with a run from a driving sheave on the motorized vehicle to a driven sheave on the ground-engaging implement, and with another run from the driven sheave to the driving sheave, the hitch unit comprising:

a body;

means on the body that is movable between an unlatched position and a latched position for attaching and detaching the hitch unit to a rear end of the motorized vehicle;

means on the body for supporting a front end of the ground-engaging implement;

first idler means for engagment of one of the runs of the drive belt, the first idler means being mounted to the body to pivot around an idler adjustment axis transverse to the rear end of the motorized vehicle, and the first idler means being biased to counter tension of the drive belt;

second idler means spaced laterally from the first idler means for engagement of the other of the runs of the drive belt, the second idler means being mounted to pivot around the idler adjustment axis independent of the pivoting of the first idler means; and

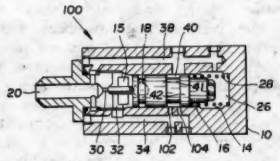
manually operable adjustment means carried by the body and coupled to the second idler means for adjusting the pivotable position of the second idler means relative to the idler adjustment axis to control tension of the drive belt.

4,600,071

FLOW CONTROL APPARATUS FOR POWER STEERING

Hisashi Kitahara; Noboru Hattori, both of Yokosuka; Yoshiaki Kato, Fujisawa, and Nobuteru Hitomi, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 12, 1984, Ser. No. 660,099
Claims priority, application Japan, Oct. 14, 1983, 58-190973
Int. Cl.[4] B60K *25/00*
U.S. Cl. 180—53.8 6 Claims



1. A system comprising:

an engine;

an ancillary device;

a pump for supplying fluid under pressure to a servo mechansim;

a transmission which provides a drive connection between said engine, said ancillary device and said pump, said transmission being shiftable between first and second gear ratios to reduce the rate at which said pump and said ancillary device are driven by said engine;

a valve interposed between said pump and said servo mechanism for modifying the amount of fluid supplied from said pump to said servo, said valve inducing a first flow reduction between first and second pump speeds and second flow reduction between third and forth pump speeds; and

a transmission shift control arrangement which is responsive to the load on said ancillary device in a manner that when said load is below predetermined level said transmission is downshifted from said first gear ratio to the second one at a first engine speed and when said load is above said predetermined level said transmission is downshifted from said first gear ratio to the second one at a second engine speed which is higher than the first one,

said first engine speed being selected to be lower than the engine speeds which correspond to said first pump speed when said transmission is in said first gear ratio, and

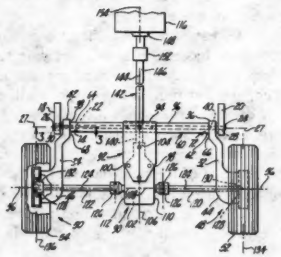
said second engine speed being selected to be between the engine speeds which correspond to said second and third pump speeds when said transmission in in said first gear ratio.

4,600,072

INDEPENDENT WHEEL SUSPENSION USING THRUST BEARING CONSTANT VELOCITY UNIVERSAL DRIVE JOINTS AS SUSPENSION MEMBERS IN COMBINATION WITH A WHEEL ASSEMBLY AND DIFFERENTIAL COUPLED TO PIVOT ABOUT A TRANSVERSE STABILIZER

Werner Krude, Grosse Pointe Park, Mich., assignor to GKN Automotive Components, Inc., Southfield, Mich.

Filed Mar. 5, 1984, Ser. No. 586,098
Int. Cl.[4] B60K *20/00*
U.S. Cl. 180—73.3 12 Claims



1. An independent wheel suspension system for a vehicle having a chassis, vehicle support means comprising a first and a second frame member for supporting said chassis for displacement relative to a driving surface, a pair of laterally disposed wheel assemblies each having a wheel rotatable about a wheel axis, an engine adapted to provide driving torque about an engine output axis at an engine output, differential means having a differential input axis at a differential input and a differential output on opposite sides of said differential input axis, and a pair of universally coupled drive shaft means respectively coupling one said wheel and one said differential output, said independent wheel suspension system comprising:

stabilizer means coupled to said first and second frame members so as to be rotatable about a transverse pivot axis, said stabilizer means being coupled to each of said wheel assemblies and said differential means so as to permit movement about said transverse pivot axis between said wheel assemblies and said differential means relative to said vehicle support means; and

a prop shaft with a prop shaft axis, an engine end universally coupled to said engine output, and a differential end con-

nected to said differential input so that said prop shaft axis is coaxial with said differential input axis;

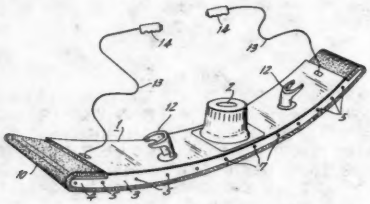
whereby articulation of said prop shaft axis relative to said engine output axis is accommodated by movement of said differential means about said transverse pivot axis.

4,600,073

ENGINE-DRIVEN PLATFORM FOR SPORTS, ENTERTAINMENT AND SIMILAR PURPOSES

Ronald G. K. Honett, Rue Tres Irmaos, 650 casa 5, Sao Paulo, Brazil

Filed Oct. 2, 1984, Ser. No. 656,861
Claims priority, application Brazil, Apr. 11, 1984, 8401758
Int. Cl.[4] B62M *27/02*
U.S. Cl. 180—181 **4 Claims**



1. An engine driven platform for conveying a person, comprising:

a chassis on which a user may stand and having forward and rearward foot locations on which a user's feet may be respectively positioned;

an endless belt means on which the chassis is mounted for conveying the chassis along an underlying surface; and

an engine mounted on the chassis and coupled to the endless belt for imparting driving power to the endless belt means;

the bottom of the endless belt means being curved for a predetermined distance from a front portion of the belt means forward of the forward foot location to a rear portion rearward of the rearward foot locations, the predetermined distance being sufficient in extent that a user may change the direction of travel of the platform by mere sideways inclination of the user's body.

4,600,074

ALL WHEEL DRIVE VEHICLE

Masaki Watanabe, Saitama; Akio Yagasaki, Tokyo, and Yoshinori Kawashima, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,200
Claims priority, application Japan, Jun. 7, 1983, 58-100131
Int. Cl.[4] B60K *17/342*
U.S. Cl. 180—251 **10 Claims**

1. An all-wheel-drive vehicle comprising:

(a) a body;

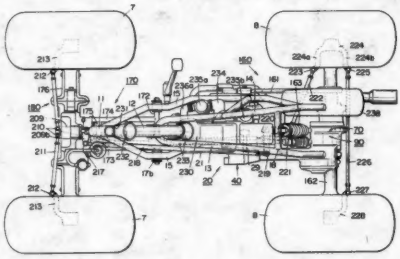
(b) an engine mounted on said body and having an output shaft;

(c) front and rear pairs of wheels drivable by power from said engine, said front and rear wheels being vertically movably suspended from said body;

(d) axles coupled to the front and rear wheels;

(e) first power transmitting means for transmitting power from said output shaft of the engine to one of said axles of the front and rear wheels;

(f) a power output unit mounted on said one axle; and



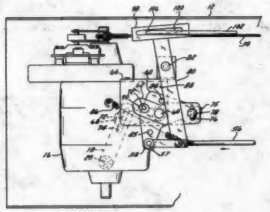
(g) second power transmitting means for transmitting power from said power output unit to the other of said axles of the front and rear wheels.

4,600,075

TRANSMISSION NEUTRAL RETURN FOR LAWN AND GARDEN VEHICLES

Richard C. Heidner, West Bend; Clyde R. Wetor, Cascade, and Bruce H. Fiedler, Plymouth, all of Wis., assignors to Gilson Brothers Company, Plymouth, Wis.

Filed Feb. 11, 1985, Ser. No. 700,467
Int. Cl.[4] B60K *23/00*
U.S. Cl. 180—336 **17 Claims**



1. A control assembly for use in controlling the operation of a transmission, the transmission including a drive control member movable from a neutral position in one direction to cause the transmission to be shifted to a forward driving mode, and movable from the neutral position in an opposite direction to cause the transmission to be shifted to a reverse driving mode, the control assembly comprising:

a first lever supported for pivotal movement about a pivot axis, the first lever being connected to the drive control member for selectively causing movement of the drive control member from the neutral position in said one direction in response to pivotal movement of the first lever from a neutral position to a forward driving position and for selectively causing movement of the drive control member from the neutral position in said opposite direction in response to pivotal movement of the first lever from a neutral position to a rearward drivng position,

a second lever supported for pivotal movement about said pivot axis, said second lever being selectively movable with respect to said first lever,

a control member supported for pivotal movement from a neutral position in a first direction and from said neutral position in an opposite direction, said control member being adapted to be controlled by the operator,

a linkage operably connecting said control member to said second lever such that pivotal movement of said control

member causes pivotal movement of said second lever about said pivot axis, and

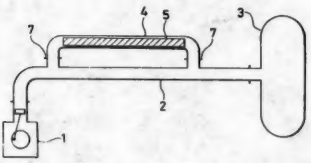
means for selectively securing said second lever to said first lever such that said first lever will pivot about said pivot axis with said second lever when said control member causes movement of said second lever.

4,600,076

DEVICE FOR ATTENUATING PULSATION OF FLUIDS IN PIPING SYSTEMS

Shizuo Yamamoto, Tokyo; Tetsuo Kanda, Yokohama; Nobuaki Suzuki, and Hiroyuki Matsuda, both of Kanagawa, all of Japan, assignors to Chiyoda Chemical Engineering & Con. Co., Ltd., Japan

Continuation-in-part of Ser. No. 412,987, Aug. 30, 1982, abandoned. This application Oct. 16, 1984, Ser. No. 661,340
Claims priority, application Japan, Sep. 9, 1981, 56-140919
Int. Cl.⁴ F16L *55/02*
U.S. Cl. 181—233 **5 Claims**



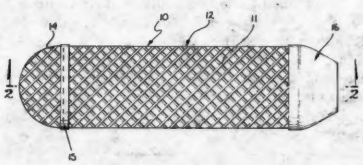
1. A device for attenuating pulsation waves occurring in a piping system and caused by a fluid passing through a length of the piping system, which device comprises (a) at least one fluid branching pipe communicating with said piping system at a plurality of positions thereof for passing a partial flow of said fluid, and returning said partial flow to said fluid through through said fluid branching pipe, said fluid branching pipe having flow passage zones which are separated acoustically from said piping system except for said plurality of positions, and (b) acoustic damping means comprising a plurality of orifice means and/or disc means having an overall percentage of opening area of 40% or more in said fluid branching pipe, said fluid branching pipe being thus open for passage of fluids.

4,600,077

MICROPHONE WIND SHROUD

Leslie C. Drever, 8351 Columbus Ave., Panorama City, Calif. 91402

Filed Jan. 25, 1985, Ser. No. 695,168
Int. Cl.⁴ F01N *7/00*
U.S. Cl. 181—242 **7 Claims**



1. A microphone wind shroud comprising:

a resilient annular body member having cutout portions therethrough and being opened at a first and second end;

a wind noise attenuation medium of laminate material including a first layer of napped nylon, a second layer of open-cell polyurethane foam, and a third layer of woven nylon securedly maintained immediately over said cutout portions;

a hollow head member having cutout portions therethrough and having an opening at the first end thereof, said head member being fixedly secured to said body member about the periphery of the respective first ends thereof forming a unitary shroud section opened at one end for being placed over the transducing end of a microphone;

said cutout portions of said body member and said head member comprising a flexible plastic grid of polypropylene plastic;

an annular mount section having a first end fixedly secured to said open end of said shroud section, and a second end;

a resilient cylindrical foam insert aligned along the longitudinal axis of said second end, and a foam retaining means between the outer periphery of said foam insert and the inner periphery of said annular mount section for retaining said foam insert in place such that said microphone wind shroud is slidably securable to a microphone by sliding said microphone through said foam insert;

whereby said wind shroud is securely maintained on said microphone by the gripping force of said compressive foam insert;

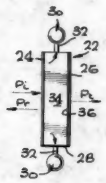
and whereby wind noise is attenuated by said wind shroud but desired audio frequencies pass freely therethrough.

4,600,078

SOUND BARRIER

Leslie S. Wirt, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 12, 1983, Ser. No. 560,632
Int. Cl.⁴ E04B *1/82*
U.S. Cl. 181—286 **27 Claims**



1. A sound barrier comprising:

a pair of spaced apart members for reflecting and propagating sound waves impinging thereon;

a medium disposed between said members for propagating sound waves, said spaced apart members producing a transmission loss in said impinging sound waves and said spaced apart members, said medium, and said impinging sound waves coacting to produce a resonant condition occurring at one or more particular frequencies to reduce said transmission loss of said impinging sound waves at and around said particular frequencies; and

one or more acoustical resonators coupled to said medium and tuned to one or more of said particular frequencies to cause a transmission loss at and around said particular frequencies.

4,600,079

NON-SLIP RESILIENT LADDER SUPPORT

Thomas D. McBride, 559 Chestnut St., Westwood Post Office, N.J. 07675

Filed Oct. 24, 1985, Ser. No. 790,990
Int. Cl.⁴ E06C *5/36, 7/48*
U.S. Cl. 182—108 **12 Claims**

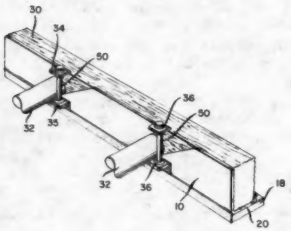
1. A non-slip resilient ladder support disposed to be used in pairs with each removably attachable to the stile of a ladder to protect the surface or surfaces against which the ladder is rested, each of said supports including:

(a) a side plate member disposed to be removable contiguous with inner side surface of a ladder stile, this side plate member having at least two substantially equally sized and

angled slots sized to slidably receive and retain adjacent rungs of the ladder;

(b) a stile engaging edge portion attached to and extending from said side plate member and substantially normal thereto;

(c) a resilient support surface member attached to the outer surface of the stile edge engaging portion;



(d) means for providing a retaining member adapted to form a longitudinal and slideable guideway for the stile of a ladder, and

(e) means for removable securing and retaining said support to adjacent rungs of said ladder, the retained support presenting said resilient support surface member to the fixed surface against which the ladder is leaned.

4,600,080

THREE-LEGGED STEPLADDER

Charles R. Forrester, 204 N. Mendenhall St., Greensboro, N.C. 27401

Continuation of Ser. No. 590,902, Mar. 19, 1984, abandoned. This application Sep. 12, 1985, Ser. No. 775,428

Int. Cl.[4] E06C *1/14, 1/393*

U.S. Cl. 182—124 **4 Claims**

1. A stepladder of the tripod type comprising:

(a) a front pair of side legs or stiles supporting and connected by a plurality of steps or rungs, said side legs diverging slightly from top to bottom, and a top step or platform joining the upper ends of said side legs;

(b) a third leg pivotally attached at the upper end thereof to said top platform and movable between a closed storage position and an open "in use" position;

(c) a triangular bracing means connecting said front pair of side legs and said third leg, said bracing means comprising:

(i) a sleeve or collar surrounding the front, rear, and sides of said third leg in slidable relation thereto;

(ii) a first, straight, linearly extending rod or bar pivotally connecting one side of said sleeve with one of said front legs;

(iii) a second, straight, linearly extending rod or bar pivotally connecting the other side of said sleeve with the other of said front legs;

(iv) whereby a rigid, sturdy, triangular bracing system is formed by the front steps and the two straight rods which serve to steady the pair of side legs and resist lateral motion of the third leg when in the open position;

(d) a pail shelf pivotally connected to said third leg and movable between a vertical storage position and a horizontal pail supporting position in which the forward portion of said shelf underlies one of the uppermost of said steps or rungs.

4,600,081

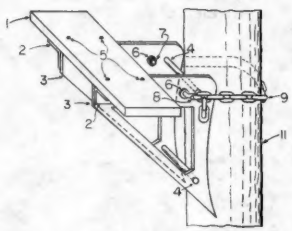
PORTABLE TREE SEAT FOR HUNTERS AND OUTDOORSMEN

Richard J. Wade, 5677 Hempline, St. Louis, Mo. 63129

Filed Apr. 15, 1985, Ser. No. 723,541

Int. Cl.[4] A01M *31/02;* **A45F** *3/26;* **A47C** *9/10*

U.S. Cl. 182—187 **3 Claims**



1. A portable seat and climbing device to be utilized in conjunction with an upright wooden structure such as a tree or pole as a means for providing a secure horizontal platform or seat, or in combination with tree climbing platforms as an aid-assist in climbing, or as a stationary seat to be utilized in combination with permanently affixed or portable static type tree platforms and includes: dual generally 45 degree triangular tree engaging support plates, symmetrically alligned structurally adjoined and laterally spaced by means of a cross interconnected horizontally extending seat and two elongated non-structure engaging transverse interconnecting members, the vertical leg edge surfaces of said tree engaging support plates being vertically disposed to said upright wooden structure and merging upwardly into rounded fulcrum surfaces to outwardly extending horizontal leg surfaces and said interconnected seat; integral angulating leg surfaces downwardly inclined toward said structure and adjoining said horizontal and vertical leg surface extremities; an in-elastic laterally disposed extended structure engaging means such as a chain for encircling said structure and fastening said tree seat device to said structure; the said tree engaging support plates each having an opposing and outwardly protruding connection means for attaching said extended structure engaging means selectively and releasibly to the exterior face of one said support plates' horizontal legs outer surface and permanently attaching the opposite end of said engaging means to the exterior face of the opposing said support plates horizontal legs' outer surface; said interconnecting means and said extended structure engaging means lying along the same horizontal plane at a level below the upper surface of said seat and the top edge surfaces of said support plates' horizontal legs.

4,600,082

FOLDABLE HUNTING SEAT

Richard A. Rauls, 4350 Hammond Dr., Martinez, Ga. 30907

Filed Jul. 9, 1985, Ser. No. 753,062

Int. Cl.[4] A01M *31/02;* **A45F** *3/26;* **A47C** *9/10*

U.S. Cl. 182—187 **6 Claims**

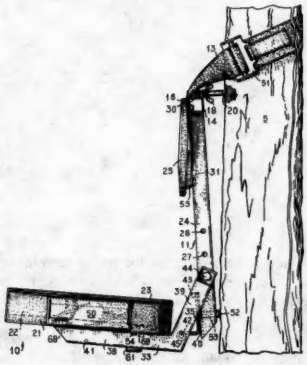
1. A portable seat device for attachment to and temporary use on the trunk of a tree, comprising:

(a) a frame member having at least one coupler attached to the upper surface thereof and an elongated tailpiece;

(b) at least one support pin with a pronged end, the pin being threadedly engageable with the coupler, the longitudinal axes of the shaft of the pin and of the tailpiece being disposed generally perpendicularly to each other;

(c) means pivotally connected to the tailpiece proximate the end thereof which is distal the coupler for supporting a seat member;

(d) means for encircling the trunk including a pair of flexible members, one end of each flexible member being attached to a side of the frame member which is distal the support pin, a portion of each flexible member being positioned to pass over an edge between said side and said upper surface of the frame member proximate the coupler when the trunk is encircled, the edge being disposed generally downwardly of the longitudinal axis of the shaft of the support pin but at a distance from the support pin which is less than the distance from its pronged end to an imaginary line which intersects the edge, said line being disposed parallel to the longitudinal axis of the tailpiece; and



(e) means including the elongated tailpiece for increasing the tension on the flexible members while they are encircling the trunk, a net increase in tension arising with a shifting in the orientation of the shaft of the support pin as the longitudinal axis of the shaft is brought into general alignment with the direction of the composite of the tension forces on the flexible members; during said shifting, the longitudinal axis of the shaft of the support pin being initially oriented downwardly at a first acute angle with respect to the trunk of the tree and then oriented upwardly with respect to its longitudinal centerline at a second acute angle which is at least a few degrees less than 90° when the distal end of the tailpiece has been rotated downwardly as far as possible about the pronged end of the support pin, thereby facilitating the insertion of the pronged end into the bark of the tree and the retention of the distal end of the tailpiece proximate the trunk once the tailpiece has been so rotated.

4,600,083

POSITIONING SYSTEMS

Christopher A. Parent, 187 Woodbrook Ter., West Springfield, Mass. 01089, and James R. Voss, 6 Eastwood Dr., Wilbraham, Mass. 01095

Filed Sep. 6, 1984, Ser. No. 647,746

Int. Cl.⁴ B66B *11/04;* **G01D** *15/16;* **B43L** *13/00*

U.S. Cl. 187—7 **4 Claims**

1. A positioning system comprising:

a stationary member,

a first guide means fixed relative to the stationary member,

a second guide means having one end hingedly connected to the first guide means and the other end being free of the first guide means,

the first and second guide means being substantially mutually perpendicular,

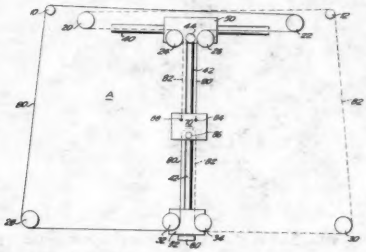
a first carriage being linearly reciprocable along the first guide means in an X direction,

a second carriage fixed to the free end of the second guide means,

a carrier being reciprocable linearly along the second guide means in a Y direction,

a pair of spaced bidirectional drives mounted on the stationary member,

a plurality of spaced guide pulleys,



a single drive chain defining a closed loop having opposite free ends fixed to the carrier and trained over and operatively engaging the first and second carriages and the drives and pulleys, a retainer on the carrier for the shifting entrainment therearound of the drive chain intermediate the opposite free ends thereof in the displacement of the first and second carriages along the respective guide means and of the carrier along the second guide means in the attainment of any desired angular and translational orientation of the carrier relative to the stationary member, and

means for selectively rendering each of the drives operative and inoperative for positioning the carrier at any desired coordinate position on an X-Y coordinate plane.

4,600,084

HYDRAULIC MANIFOLD FOR TWO AND THREE STAGE MASTS

William C. Ray, Cedar Lake, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 8, 1984, Ser. No. 669,360

Int. Cl.⁴ B66B *9/20;* **E03B** *0/00;* **F01B** *29/04, 1/02*

U.S. Cl. 187—9 E **5 Claims**

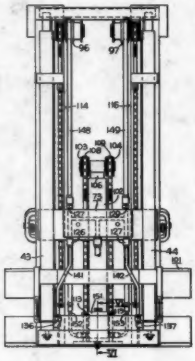
1. In a lift truck having a mast assembly including a primary mast section mounted on the front of the lift truck, a secondary mast section mounted on the primary mast section for vertical reciprocation relative thereto and a pair of lift jacks having cylinders mounted on the bottom of the primary mast section and rods connected to the top of the secondary mast section and wherein the primary and secondary mast section may be used in a three stage mast assembly having a tertiary mast section with a carriage lift jack, a hydraulic manifold comprising:

a manifold block secured to the rear of said primary mast section including

a first bore in said block defining a vertical supply passage having one end terminating within said block and a second end terminating at a supply port in the bottom surface of said block and adapted for connection to a source of pressure fluid,

a second and third bore in said block defining a pair of laterally spaced delivery passages each extending upwardly predetermined distances from ports in said bottom surface, one of said delivery passages terminating at the

top of said block at a top port adapted to receive a plug when said primary mast is used in a two stage mast assembly and to receive a connector for a conduit connected to said carriage lift jack when said primary mast section is used in a three stage mast assembly,



a fourth bore in said block defining a transverse passage interconnecting said supply passage with said delivery passages, and

conduits connecting said bottom ports in fluid communication with said lift jacks, respectively.

4,600,085

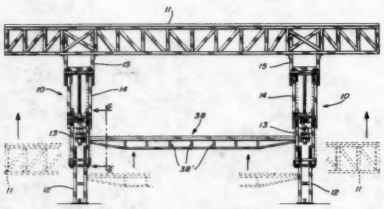
PLATFORM LIFT

Pierre Gagnon, 5637 Wilderton Avenue, Montreal, Canada H3T 1S1, and Pierre LaForest, 1945 Bruxelles Street, Montreal, Canada H1L 5Z5

Filed Nov. 19, 1984, Ser. No. 673,108

Int. Cl.[4] B66B *1/00;* **B60S** *13/00;* **B66F** *7/12;* **A63J** *1/02*

U.S. Cl. 187—24 **17 Claims**



1. A platform lift comprising at least one module; said module being formed of four distinct, upright segments, including a first segment adapted to be secured to a supporting surface, a second segment telescopically, vertically slidable relative to said first segment; a third segment similarly telescopically slidable relative to said second segment, and a fourth segment similarly telescopically sildable relative to said third segment; said second segment laterally straddling said first segment and said third segment laterally straddling said second segment, and said fourth segment laterally straddling said third segment; a primary lift means secured to said second and said third segments and adapted to raise and lower said third segment relative to said second segment; a first passive lift means adapted to vertically displace said second segment relative to said first segment and, a second passive lift means adapted to vertically displace said fourth segment relative to said third segment as said primary lift means is actuated; guide means between said first and second segments, between said second and third segments, and between said third and said fourth segments; power means to operate said primary lift means, and a transmission means mechanically connecting the latter to the power means; the upper portion of said fourth segment adapted to be secured to the underside of a platform to be lifted.

4,600,086

ELEVATOR HOIST APPARATUS

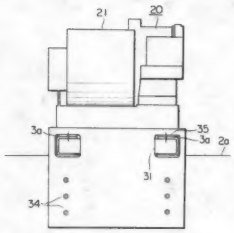
Shinji Yamasaki, Kohnan; Yoshiki Sugiyama, Nagoya; Itsurou Tangiku, Ichinomiya, and Yasumasa Iida, Nagoya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,021

Claims priority, application Japan, Mar. 16, 1984, 59-51791; Apr. 4, 1984, 59-67194; Apr. 4, 1984, 59-67195; Apr. 4, 1984, 59-49226[U]; Apr. 11, 1984, 59-72156

Int. Cl.[4] B66B *11/06*

U.S. Cl. 187—27 **8 Claims**



1. An elevator hoist apparatus for use in an elevator hoistway having a machine room provided above the pit portion of the hoistway which opens onto said hoistway, comprising:

a hoist;

a base on which said hoist is rigidly mounted; and

plate-like securing means for securing said base to the wall of said hoistway just below said machine room, said securing means having a base-securing hole formed therein near its upper end, said securing means being secured to the wall of said hoistway just below said machine room, one end of said base passing through said base-securing hole and being rigidly connected to said securing means.

4,600,087

APPARATUS FOR REGISTERING ELEVATOR CALL

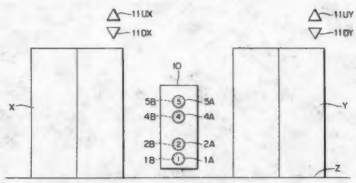
Shintaro Tsuji, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 18, 1984, Ser. No. 632,011

Claims priority, application Japan, Jul. 22, 1983, 58-134017; Oct. 7, 1983, 58-187821; Jan. 27, 1984, 59-12986

Int. Cl.[4] B66B *1/18*

U.S. Cl. 187—29 R **18 Claims**



1. In an apparatus for registering elevator calls including a hall operation board provided for each of a plurality of platforms where a plurality of cages are placed in service, hall call registering means for registering a call for calling a cage to a

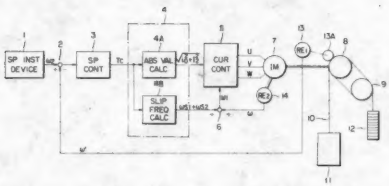
given floor and a destination call for designating a designating a destination floor from the given floor by manipulating the hall operation board, any one of said cages being allotted to be put into service responsive to said calls, and a cage call registering means for registering a cage call corresponding to a destination call for an allotted cage, the improvement comprising an auxiliary cage call registration instruction means which, when a non-allotted cage arrives at a floor, instructs a cage call corresponding to a destination call to be also registered for said non-allotted cage.

4,600,088

APPARATUS FOR CONTROLLING ELEVATORS

Masashi Yonemoto, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1984, Ser. No. 658,501
Claims priority, application Japan, Oct. 11, 1983, 58-189476
Int. Cl.⁴ B66B *1/30*
U.S. Cl. 187—29 R **5 Claims**



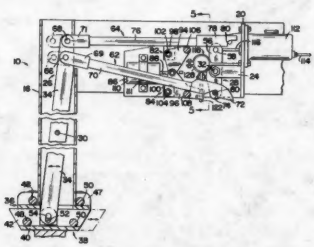
1. An apparatus for controlling an elevator comprising:
an induction motor for lifting a cage, said motor having a rotary output shaft
a speed instruction device which produces a running speed instruction signal for said cage;
a speed controller which generates a torque instruction for said induction motor;
a current controller which produces a primary current for the induction motor to control it;
a first speed detector which is coupled to said induction motor via a mechanism that increases the rate of revolutions supplied to said first speed detector and which feeds speed detection signals back to said speed controller; and
a second speed detector which is directly coupled to the rotary output shaft of said induction motor and which supplies speed detection signals to said current controller.

4,600,089

TRAILER HYDRAULIC BRAKE SYSTEM

Bill Wilson, P.O. Box 25, Lutz, Fla. 33549

Filed Mar. 20, 1985, Ser. No. 714,033
Int. Cl.⁴ B60T *7/20*
U.S. Cl. 188—112 R **26 Claims**



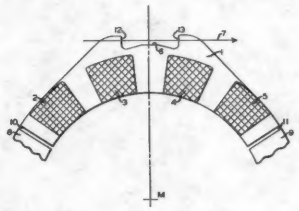
1. A trailer hydraulic brake system for use with a gooseneck trailer and truck combination comprising a frame configured to operatively mount said trailer hydraulic brake system on the gooseneck trailer, a brake actuator including a first and second brake actuator member each pivotally attached to the frame, a brake mechanism including a forward and reverse brake mechanism each pivotally coupled to the first brake actuator member, a brake mechanism positioner selectively movable between a forward and reverse position to selectively engage the forward or reverse brake mechanism and a hydraulic master cylinder coupled to the trailer brakes attached to the frame, said hydraulic master cylinder being disposed to engage said second brake actuator member such that when said brake mechanism positioner is in said forward position said forward brake mechanism engages said second brake actuator member whereby as the truck is stopped said first and second brake actuator member pivot in the same direction to actuate said hydraulic master cylinder to brake the gooseneck trailer and such that when said brake mechanism positioner is in said reverse position said reverse brake mechanism engages said second brake actuator member whereby as the truck is stopped said first and second brake actuator pivot in the opposite direction to actuate said hydraulic master cylinder to brake the gooseneck trailer.

4,600,090

BRAKE LINING SUPPORT IN DISC BRAKES

Joachim Feldmann, Neustadt, and Fritz Isernhagen, Wunstof, both of Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Aug. 22, 1983, Ser. No. 525,068
Int. Cl.⁴ F16D *65/12*
U.S. Cl. 188—218 XL **12 Claims**



1. A brake lining support in a disc brake for supporting a friction-type brake lining material between a rotating brake disc and a brake actuator comprising:
at least one brake lining support segment;
at least one brake lining pad attached to said segment;
attachment means on said segment for attaching said segment to a non-rotating part of such disc brake;
said at least one brake lining pad positioned on said segment so that the resulting force transmitted by said brake lining pad is generally directed through the region of said brake lining support segment where said attachment means is located, thereby minimizing the tilting moment of said lining support segment about said attachment means.

4,600,091

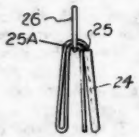
CARRYALL HANDBAG AND MAT AND METHOD OF MAKING SAME

Shirley McLeod, c/o Country Collectibles, 289 Danbury Rd., Wilton, Conn. 06897

Filed Mar. 18, 1985, Ser. No. 713,316
Int. Cl.⁴ A47C *17/82;* **B31B** *21/26, 21/60, 21/74*
U.S. Cl. 190—2 **8 Claims**

1. A combination handbag and mat comprising a blank of readily foldable sheet material having a predetermined length and width sized to define a mat in the unfolded position, said blank having an end portion reversely folded about a trans-

verse foldline so as to be disposed contiguous an intermediate portion of said blank to define a doubled over portion and an extended portion, a plurality of seams securing said reversely folded portion to said contiguous intermediate portion to define a pocket, a handle means connected to the defined pocket, said doubled over portion and extended portion being re-



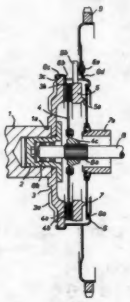
versely folded in half along a longitudinal foldline, said folded half being folded in half again along a transverse foldline a first time, and folded in half again along a second transverse foldline, and said handle being looped between the folds defined by said second foldline to provide a carrying handle for said blank in the folded position.

4,600,092

CLUTCH COVER AND FLYWHEEL SECUREMENT ASSEMBLY

René Billet, Lamorlaye, and Michel Bacher, Garges-les-Gonesse, both of France, assignors to Valeo, Paris, France

Filed Apr. 28, 1983, Ser. No. 489,534
Claims priority, application France, Apr. 29, 1982, 82 07392
Int. Cl.[4] F16D *13/58*
U.S. Cl. 192—70.11 **14 Claims**



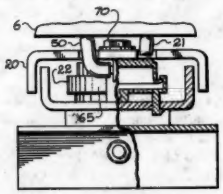
1. A clutch for a motor vehicle comprising, in axial succession, a reaction plate, means for fixing said reaction plates for rotation with a first shaft, a clutch plate, means for fixing said cultch plate for rotation with a second shaft, a pressure plate fixed for rotation with and axially movable with respect to said reaction plate, a clutch cover axially fixed to said reaction plate for rotation therewith, resilient means bearing against said cover and constantly urging said pressure plate toward said reaction plate for sequeezing or clamping said clutch plate therebetween, the improvement wherein said reaction plate has a cylindrical peripheral surface and a planar annular bearing surface for engagement with said clutch plate adjoining said cylindrical peripheral surface, said cover having a skirt defining a recess for receiving the peripheral portion of said reaction plate, said skirt having a crimped zone crimping it to said reaction plate, said recess having a machined planar surface fittingly engaged with said annular bearing surface and a machined cylindrical surface fittingly engaged with said cylindrical peripheral surface of said reaction plate, for precision centering of said cover on said reaction plate.

4,600,093

BRAKE FOR ROLLER CONVEYORS

Arthur R. Adams, Mt. Sterling, Ohio, assignor to Versa Corporation, Mt. Sterling, Ohio

Filed Apr. 12, 1985, Ser. No. 722,393
Int. Cl.[4] B65G *13/075*; F16D *69/04, 51/00*
U.S. Cl. 193—35 A **6 Claims**



1. An improved brake mechanism for roller conveyors having a plurality of spaced, generally parallel aligned rollers; said brake mechanism comprising:

(a) a movable brake plate having a first, non-braking, orientaion and a second, braking, orientation;

(i) said brake plate having a brake shoe engaging surface with first and second end edges;

(ii) said brake plate having a first rigid extension mounted substantially adjacent said first end edge, and a second rigid extension mounted substantially adjacent said second end edge;

(b) motive means for selectively motivating said brake plate between said first, non-braking, orientation and said second, braking, orientation;

(c) a brake shoe comprising an elongated band of resilient material formed in a substantially continuous loop;

(i) said brake shoe being mounted on said brake shoe engaging surface by extension between said first and second rigid extensions, and being securely held thereon by resiliency of said loop;

(ii) said brake shoe forming first and second discrete braking sections extending between said first and second rigid extensions and over said brake shoe engaging surface;

(d) whereby whenever said brake plate is in said braking orientation, at least one roller is engaged by both of said transverse braking members, said roller being prevented from rotation thereby; and

(e) whereby said brake shoe may be rapidly removed from said brake mechanism and replaced therein.

4,600,094

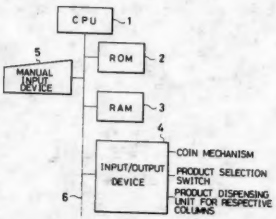
AUTOMATIC VENDING MACHINE WITH ROTATIONAL DISPENSING FUNCTION

Yukichi Hayashi; Eiji Itako, both of Sakado, and Masahiro Yasuhara, Tsurugashimamachi, all of Japan, assignors to Kabushiki Kaisha Nipponcoinco, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,793
Claims priority, application Japan, Mar. 9, 1984, 59-43980
Int. Cl.[4] G07F *11/04*; B65G *59/06*
U.S. Cl. 194—217 **3 Claims**

1. An automatic vending machine for dispensing products in rotation from a plurality of columns, comprising: setting means for respectively setting product numbers of said plurality of columns in accordance with the numbers of products stored in said plurality of columns; dispensing pattern calculating means for calculating dispensing product numbers of said plurality of columns in accordance with the product numbers set by said setting means; down counters which are preset with values respectively corresponding to the dispensing product numbers calculated by said dispensing pattern calculating means and which are respectively decremented every time the products are dispensed from said plurality of columns; discriminating

means for discriminating one of said down counters which has a maximum value; dispensing means for dispensing the products from a column corresponding to one of said down counters which is discriminated to have the maximum value by said



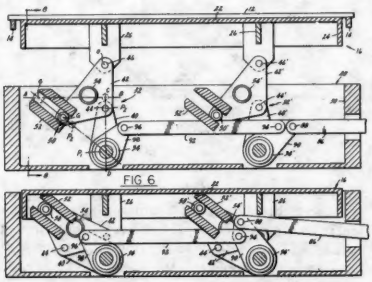
discriminating means; detecting means for detecting zero counts of all of said down counters; and resetting means for resetting the values calculated by said dispensing pattern calculating means in said down counters to zero in response to an output from said detecting means.

4,600,095

MECHANICAL WELDING PRESS

John H. Brems, Boca Raton, Fla., and Arthur C. Mason, Warren, Mich., assignors to Lamb Technicon Corp., Warren, Mich.

Filed Nov. 19, 1984, Ser. No. 672,695
Int. Cl.[4] B65G *47/00*
U.S. Cl. 198—346.2 **12 Claims**



1. In a machine having a conveyor extending therethrough and a work station located vertically above a portion of the conveyor within the machine, the combination of:

A. a vertically movable workpiece support in the machine;

B. a lift mechanism located below the conveyor and connected with the support for lifting a workpiece from the conveyor in a substantially straight vertical path to said work station and subsequently lowering the workpiece in a reverse vertical path from the work station onto the conveyor, said lift mechanism comprising:

1. a base,

2. a first pair and a second pair of links longitudinally spaced apart, means rigidly connecting together the links of each pair in axially spaced apart relation, each link having a first pivot point connecting each link to said base and a second pivot point displaced from said first pivot point by a first distance,

3. a first pair and a second pair of bell cranks longitudinally spaced apart, means rigidly connecting together the bell cranks of each pair in axially spaced apart relation, each bell crank connected with one associated link, each bell crank having three triangularly related pivot points thereon comprising:

(a) a center pivot point connected with its respective link at said second pivot point,

(b) a guide pivot point spaced from said center pivot point by a second distance, and

(c) an output pivot point spaced from said center pivot point by a third distance and connected with said support,

said pivot points permitting relative pivotal movement of the links and bell cranks about generally horizontally extending parallel axes, the triangles defined by the three pivot points on the bell cranks of each pair being similar triangles, the distances on each of the connected links and bell cranks of each pair between the first and second pivot points, between the second and guide pivot points and between the second and output pivot points being substantially equal,

4. a first pair and a second pair of guides longitudinally spaced apart on said base for guiding each associated guide pivot point along a straight line passing through the pivot axis of the first pivot point and inclined to the horizontal at an angle such that when each link is pivoted to a position wherein the first, second and guide pivot points lie in said straight line, a line extending between said first pivot point and said output pivot point is substantially perpendicular to the horizontal; and

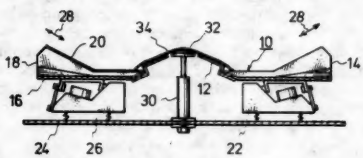
5. drive means for pivoting said first and second pairs of links in unison and alternately in opposite angular directions.

4,600,096

DISPERSION FEEDER

Shoji Yamano, Akashi; Yoshitaka Mikata, Himeji; Tadashi Higuchi, Akashi, and Kazuhiro Nishide, Kobe, all of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Sep. 10, 1984, Ser. No. 648,589
Claims priority, application Japan, Jan. 19, 1984, 59-8180
Int. Cl.[4] B65G *47/72, 27/00*; G01G *13/08*
U.S. Cl. 198—505 **2 Claims**



1. A dispersion feeder for distributively feeding product to a plurality of weighing units arranged circularly about a common axis, comprising a plurality of conveyer troughs arranged radially about said axis for communicating by their outer ends respectively with said weighing units, and a plurality of vibrating units attached respectively to said conveyer troughs for subjecting each conveyer trough to independent vibration; wherein each said conveyer trough is provided with a projection inclined upwardly and radially inwardly toward said common axis, said projections being arranged radially about said axis without mutual contact to form a generally conical or domed substantially continuous central dispersion surface, each projection, as a segment of said dispersion surface, and its corresponding conveyer trough being adapted to be subjected to independent vibration to feed product supplied directly onto said segment of the dispersion surface to the corresponding conveyer trough.

4,600,097
SCRAPER UNITS FOR MINE CONVEYOR SCRAPER-CHAIN ASSEMBLIES

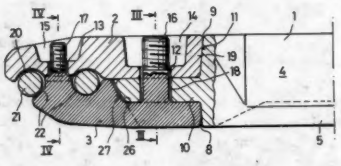
Helmut Temme, Waltrop, and Karl-Heinz Wrobbel, Hagen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia and Hammerwerke Haspe Gebruder Kettler, both of, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,898

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301685

Int. Cl.[4] B65G *19/24*

U.S. Cl. 198—731 **10 Claims**



1. A scraper unit for a scraper-chain assembly of a conveyor; said unit comprising an elongated scraper with end regions each provided with a web wall extending generally longitudinally of the scraper, a bore extending through said web wall, a pocket accessible from the underside of the end region and at least one generally upstanding flank surface defining a shaped recess adjacent the web wall and accessible from the upperside of the end region; upper coupling pieces disposed above the end regions of the scraper; each upper coupling piece being shaped to engage in the shaped recess of the associated scraper end region, the upper coupling pieces and the web walls of the scraper end regions having additional interengaging projections and recesses offset transversally of the horizontal axis of the scraper, each upper coupling piece having first and second through bores spaced apart longitudinally of the scraper which extend into openings accessible from the upper surface of the upper coupling piece; lower coupling pieces disposed beneath the end regions of the scraper, each lower coupling piece engaging snugly within the pocket of the associated scraper end region, each lower coupling piece having first and second upstanding threaded pins spaced apart longitudinally of the scraper to correspond with and engage through the first and second bores of the associated upper coupling piece, respectively, the first pin also engaging through the bore in the web wall of the associated scraper end region; means on the facing surfaces of the upper and lower coupling pieces to provide beds for receiving horizontal links of a pair of chains of the assembly; and nuts engaged with the threaded pins and locating in the openings in the upper surface of the associated upper coupling piece to clamp the unit to said chains.

4,600,098
PLATE FOR OSCILLATING-TYPE TRANSPORTER

David R. N. Orren, Saint Germain en Laye, France, assignor to Fuller Company, Bethlehem, Pa.

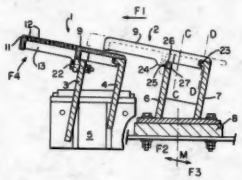
Filed Mar. 19, 1984, Ser. No. 590,946

Claims priority, application France, Mar. 24, 1983, 83 04861

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—773 **6 Claims**

1. A grate plate for use in a reciprocating grate type material transport apparatus in which a plurality of juxtaposed grate plates are mounted on supports to form rows of grates wherein movable rows of grates alternate with fixed rows of grates, said supports including forward support post means and rearward supports posts means including a plurality of spaced apart posts and a transverse bar mounted on the forward side of the rearward posts interconnecting the spaced apart posts, said grate plate being a generally rectangular shape and having an upper surface adapted to support the material to be transported, a pusher surface on the front end of the grate plate and a lower surface, the improved grate comprising a transverse rib on the lower surface of the grate plate having a centrally positioned, downwardly projecting tab having an opening therethrough parallel to the length of the grate plate adapted to receive a fastener for securing the grate plate to the support, a lateral wing on each side of the grate plate, each wing having a detent



at the rear end of the grate plate defined by a cut out dimension so that the transverse bar fits into the cutout and the rear end of each wing substantially abuts the rearward support post and a protrusion adapted to cooperate with the forward support post means whereby the grate plate is supported at four spaced apart points.

4,600,099
TRANSVERSE CONVEYOR OF ELONGATED WORKPIECES

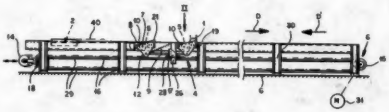
Rolf Peddinghaus, Deterbergerstr. 25k, 5828 Ennepetal, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,602

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331341

Int. Cl.[4] B65G *25/02, 25/10*

U.S. Cl. 198—774 **11 Claims**



1. A conveyor for transporting an elongated workpiece in a normal transport direction that is horizontal and generally perpendicular to the workpiece, the conveyor comprising:

a rail extending horizontally in the normal transport direction and having an upper rail surface, a front rail end, and a rear rail end;

a carriage riding on the rail and displaceable therealong in the transport direction;

a pair of end links pivoted on the carriage at respective generally parallel support axes extending horizontally generally perpendicular to the transport direction and spaced apart in the transport direction;

a lifting member having an upper horizontal member surface and pivoted on the end links at respective member axes generally parallel to and offset from the respective support axes;

a lower link pivoted on the end links at lower axes generally parallel to and offset from the respective member axes and forming a parallelogrammatic linkage with the lifting member and end links, the linkage being movable between a raised position with the upper member surface above the rail and a lowered position with the upper member surface below the upper rail surface;

a spring engaged with the linkage and urging same into the lowered position;

a stop pawl pivotal on one of the end links in the lowered position of the linkage between an up position projecting upward beyond the upper rail surface and a down position below the upper rail surface, the stop pawl lying below

the upper rail surface in the raised and intermediate positions of the linkage;

spring means engaged between the one end link and the stop pawl for urging same into the up position, the pawl being shaped such that on movement of the carriage along the rail opposite to the transport direction with the linkage in the lowered position a workpiece on the rail can deflect the pawl against the force of its spring into its down position and the carriage can pass under the workpiece and on movement in the transport direction the stop pawl engages a workpiece sitting on the upper rail surface without such downward deflection and can push it in the transport direction;

respective front and rear wheels at the respective ends of the rail;

a flexible element spanned over the wheels and having a front end operatively connected to the carriage and a rear end secured to one of the end links at a location offset from the respective support axis; and

drive means for tensioning the element downstream relative to the normal transport direction and thereby pulling the carriage in the transport direction, and for tensioning the element upstream of the carriage and thereby pivoting the end links between the raised and lowered positions.

4,600,100

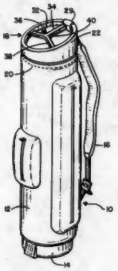
THROAT STRUCTURE FOR GOLF CLUB BAGS

John A. Solheim, 529 W. Wakonda La., Phoenix, Ariz. 85023

Continuation-in-part of Ser. No. 587,453, Mar. 8, 1984. This application Dec. 10, 1984, Ser. No. 684,102

Int. Cl.[4] A63B *55/00*

U.S. Cl. 206—315.6 **19 Claims**



9. A golf bag for carrying golf clubs in segregated groups comprising, in combination:

(a) a golf bag including an elongated tubular container with means for closing the bottom end and having an open top; and

(b) a throat structure in the open top of said golf bag, said throat structure including,

I. a ring-shaped body defining a bore and having diametrically opposed top and bottom portions when said golf bag is in a normal carrying attitude,

II. a trifurcated divider means in the bore of said ring-shaped body for dividing the bore into three separated open golf club segregationn areas, said divider means including first, second and third divider bars which extend radially from an interconnecting junction which is offset from the center of the bore of said ring-shaped body toward the bottom portion thereof.

4,600,101

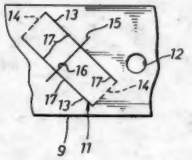
BULB PACKAGING ARRANGEMENT

Michael Naia, Annandale, N.J., assignor to Cooper Industries, Houston, Tex.

Filed Jan. 22, 1985, Ser. No. 693,598

Int. Cl.[4] B65D *85/42*

U.S. Cl. 206—422 **10 Claims**



1. A packaging arrangement for a bulb including an envelope having a convex bottom surface and a mounting base having opposite side portions projecting outwardly from the envelope, comprising:

a platform formed of an integral blank folded to form a mounting panel and a base panel;

a bulb retaining socket formed in the integral blank defined by a pair of parallel cuts in said mounting panel connected at each of their ends by a transverse score line and bisected by a transverse cut extending beyond each of the parallel cuts to form a pair of opposing end flaps resiliently hinged along said transverse score lines and yieldable side flaps between the respective transverse score lines and the transverse cut;

said bulb retaining socket being sized to receive the base of the bulb so that upon insertion of the bulb into the socket the yieldable side flaps are deflected to form a pair of opposing mounting surfaces generally contiguous with the bottom surface of the envelope and the end flaps overlie the side portions to removably secure the bulb to the platform; and

a carton sized to encapsulate the platform with the bulb thereon.

4,600,102

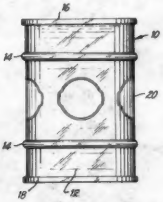
MINIATURE FANCIFUL SIMULATED OIL BARREL CONTAINING CRUDE OIL AND INDICIA MEANS THEREON USEFUL AS A NOVELTY ITEM

Ali R. Avila, Avenida Alfredo Jahn, Residencias Parque Jahn, Sixth Floor, No. 6-C, ZP 1062 P.O. Box 3121, Palos Grandes, Venezuela

Filed May 18, 1984, Ser. No. 611,722

Int. Cl.[4] B65D *85/82*

U.S. Cl. 206—457 **4 Claims**



1. A novelty item particularly useful as a decorative or conversation piece comprising a miniature container consisting essentially of a transparent material shaped to simulate an authentic barrel normally used to contain oil, a quantity of authentic crude oil contained inside said container and visible therein, said container being sealed to prevent removal of said crude oil therefrom and indicia means on the outside of said

container having imprinted thereon a name or designation fancifully associated with crude oil.

4,600,103

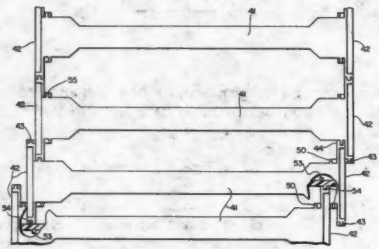
SYMMETRICAL BAKERY BASKET

Charles P. Tabler, Hamilton, Ohio, assignor to Buckhorn Material Handling Group, Inc., Milford, Ohio and Ekco Products, Inc., Wheeling, Ill.

Filed Mar. 21, 1984, Ser. No. 591,874

Int. Cl.[4] B65D *21/02, 21/04*

U.S. Cl. 206—505 **49 Claims**



1. A multilevel stacking container comprising:

(a) a horizontal, rectangular support having two pairs of opposed side edges and upper and lower substantially planar faces,

(b) opposed vertical side walls integral with one pair of said opposed side edges, said side walls joined to said opposed side edges at a central line bisecting said side walls to divide said opposed side walls into equal upper and lower opposed side walls each having a free end edge opposite said central line, and

(c) shelf means substantially parallel to said free end edge on each of said upper and lower opposed side walls, each said shelf means being located between the adjacent said free end edge and said central line, and extending inwardly toward the center of the container, for supporting a like container which may be stacked thereon in a position offset horizontally perpendicularly to said side walls with one side wall upper shelf means of the bottom container being interengaged with the lower end edge of the adjacent side wall of the top container and the upper edge of the opposite side wall of the bottom container being interengaged with the lower shelf means of the adjacent top container side wall, whereby either like container may be removed from the stacked position with the other like container, rotated 180 degrees about a horizontal mid axis and returned to the same stacked position with said other like container.

4,600,104

BAG FOR MOTHER'S MILK

Shozaburo Yanase, 2-20, Tsurigane-cho, Higashi-ku, Osaka, Japan

Filed Dec. 16, 1983, Ser. No. 561,975

Claims priority, application Japan, Jun. 8, 1983, 58-87257[U]

Int. Cl.[4] B65D *33/16, 33/38*

U.S. Cl. 206—604 **10 Claims**

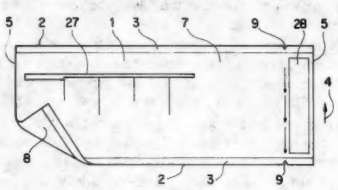
1. A bag for the hygenic preservation and storage of mother's milk in a frozen state, which bag permits the frozen mother's milk to be thawed and to be transferred hygienically and conveniently to a baby bottle, said bag comprising:

(a) a first surface and a second surface which are joined together around the peripheries thereof to define a closed interior volume which, prior to use of the bag, is at least substantially empty;

(b) said first and second surfaces each being formed from a laminated material comprising at least an inner layer and an outer layer adheringly attached to the inner layer, the inner layer of said first and second surfaces being formed of polyethylene or polypropylene and the outer layer of said first and second surfaces being formed of nylon or vinylidene chloride resin;

(c) said first and second surfaces having been slightly elongated in one direction after lamination so that both layers of said surface are preferentially tearable in said direction, but the inner layers of said surfaces have a greater elongation rate than the outer layers of said surfaces; and

(d) at least one tear notch in an edge of said first and second surfaces but not extending to the closed interior volume between said first and second surfaces, said at least one



tear notch being parallel to said direction and being located close to an edge of the bag,

whereby;

(e) an edge can be easily torn off the bag beginning at said at least one tear notch, giving access to the closed interior volume in order to fill the closed interior volume with mother's milk, and,

(f) since the inner layers of said surfaces have a greater elongation rate than the outer layers of said surfaces, when an edge is torn off the bag, the first and second surfaces inherently bend outwardly around the opening created by the tear, facilitating the hygenic filling of the bag with mother's milk by inserting a breast pump through the opening into the interior volume.

4,600,105

METHOD AND APPARATUS FOR SORTING OBJECTS OF ORE BY MONITORING REFLECTED RADIATION

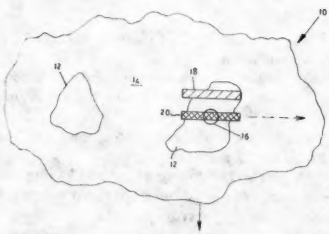
Ian D. Van Zyl, Bordeaux, and Peter Wolf, Edenvale, both of South Africa, assignors to Sphere Investments Limited, Nassau, The Bahamas

Filed Mar. 23, 1984, Ser. No. 592,841

Claims priority, application South Africa, Mar. 23, 1983, 83/2020

Int. Cl.[4] B07C *5/342*

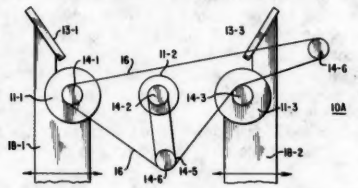
U.S. Cl. 209—587 **4 Claims**



1. A method of sorting objects of ore from other objects comprising the steps of directing a light beam across the objects in a predetermined scan pattern, detecting light reflected from the objects from the area of incidence of the beam and detecting the occurence of the re-emission of internal reflec-

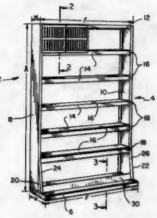
tions from translucent inclusions in the objects of ore, from an adjacent area which is removed from the area of incidence of the beam by a predetermined amount, converting the detected surface and internal reflections into first and second signals respectively, generating a third signal corresponding to the rate of change of the second signal and analyzing the three signals in accordance with predetermined parameters to determine the characteristics of each object.

4,600,106
SEPARATION OF MOLDED PARTS FROM CONNECTORS
Maurice Minardi, Box 218, Carlton City, Mass. 01508
Filed Nov. 17, 1983, Ser. No. 552,738
Int. Cl.[4] B07C *5/06, 5/12*
U.S. Cl. 209—662 **6 Claims**



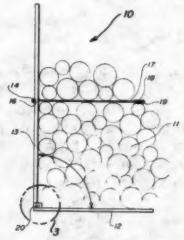
1. Apparatus for the precision separation of molded parts from connectors, which comprises
a first rotatable cylinder;
a rotatable countermember spaced from said first rotatable cylinder by a prescribed amount to permit either said molded parts or said connectors to fall through the spacing;
a second rotatable cylinder spaced from said countermember by a prescribed amount to permit said molded parts or said connectors to fall between said second cylinder and said countermember;
a continuous drive member connecting a drive motor to the first and second cylinders with a intermediate idler so that the cylinders rotate in opposite directions; and
means for rotating said countermember by said drive motor.

4,600,107
TAPE CARTRIDGE STORAGE SYSTEM
Macy J. Price, Golden, and Laurence G. Ball, Thornton, both of Colo., assignors to Engineered Data Products, Inc., Denver, Colo.
Filed Aug. 19, 1985, Ser. No. 767,154
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—41 **20 Claims**



1. A system for storing tape cartridges comprising:
a frame means;
a plurality of vertically spaced apart shelf means secured to said frame means;
each of said shelf means having at least one facing surface;
a plurality of tape cartridge storage holders, each of said tape cartridge storage holders having means for storing two vertically spaced rows of tape cartridges;
each of said tape cartridge storage holders comprising an open housing having an upper and lower flange extending therefrom;
each of said flanges terminating in an edge;
each of said tape cartridge storage holders having a length so that a plurality of said tape cartridge storage holders substantially completely fill each shelf means;
said flanges of said tape storage holders contacting an adjacent facing surface of said shelf means; and
the adjacent edges of said flanges on vertically adjacent tape cartridge storage holders being in substantially abutting relationship.

4,600,108
WOOD STACKING DEVICE AND METHOD OF STACKING WOOD
Gary C. Scott, P.O. Box 638, and Arthur W. Gibson, P.O. Box 636, both of Fall River Mills, Calif. 96028
Filed Jul. 16, 1984, Ser. No. 631,216
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 **1 Claim**



1. A wood stacking device, comprising:
a base;
a vertical member pivotally attached to said base by pivot means whereby said vertical member folds against said base for storage, and
a flexible rope having a first end and a second end, said first end being attached to said vertical member at a point substantially spaced from said pivot means and also from a free end of said vertical member for securing said vertical member tightly against said base when said wood stacking device is folded for storage and for holding said vertical member in a vertical position during stacking of wood on said base and against said vertical member when said rope is stretched over wood stacked on said base and more wood is stacked thereon, and having a rigid rod attached solely to said second end of said rope which is free to be positioned in said wood so that, when positioned in said wood, said rod helps to hold said rope in position,
whereby a stack of wood stacked utilizing said wood stacking device retains a substantially vertical edge and is neater and easier to quantify.

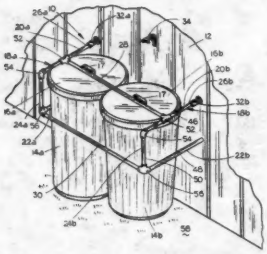
4,600,109
TRASH CAN RETAINER
Lowell V. Schulz, 1613 S. 110th St., Omaha, Nebr. 68144
Filed Oct. 12, 1984, Ser. No. 660,084
Int. Cl.[4] A47G *29/00*
U.S. Cl. 211—71 **9 Claims**

1. An apparatus for securing and supporting a trash can having a removable lid, comprising,
a pair of upright spaced-apart side members having upper and lower edges and forward and rearward ends, said side

members adapted for placement on opposite sides of a trash can situated adjacent an upright support structure,

means for pivotally connecting the rearward end of each side member to the upright support structure for up and down pivotal movement of the side members between a lowered storage position on opposite sides of a trash can and a raised access position,

a top cross bar rigidly connected to and extended between said side members adjacent the upper edges thereof and positioned between the forward and rearward ends thereof for resting on a trash can lid upon movement of said side members to the lowered storage positions thereof,



a front cross member rigidly affixed between said side members adjacent the forward ends thereof,

said front cross member being situated lower than and forwardly of said top cross member to limit forward movement of a trash can situated between said side members in the lowered storage positions thereof, and

said top and front cross bars being raised upwardly and rearwardly in clearance relation above the lid of the trash can in response to pivotal movement of the side members from the lowered storage position to the raised access positions thereof.

4,600,110

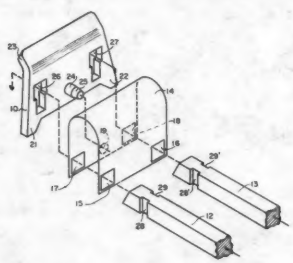
DISKETTE HOLDER

Andrés Timor, 6759 SW. N. Waterway Dr., Miami, Fla. 33155

Filed Jun. 8, 1984, Ser. No. 618,684

Int. Cl.[4] A47H *13/00*

U.S. Cl. 211—120 **2 Claims**



1. A diskette holder comprising:

a plurality of separate flexible and resilient strips;

and means for holding said strips each flexed into an inverted U-shape and assembled end-to-end in succession and disconnected from each other to resiliently hold diskettes inserted down between them, said means for holding said strips comprising upstanding end pieces at opposite ends of the assembled strips and longitudinal members extending horizontally between said end pieces and spaced apart laterally from each other and engaging each of said inverted U-shaped strips at laterally spaced locations thereon;

each of said strips having a pair of laterally spaced openings near each of its opposite ends;

said longitudinal members passing through the two openings on the corresponding side of each strip to hold the latter in its inverted U-shape;

each of said longitudinal members being a horizontally elongated, substantially straight, bottom rail located adjacent the bottom of each inverted U-shaped strip adjacent one side of the end-to-end assembly of said strips;

each of said bottom rails having vertical grooves therein near its opposite ends to provide narrower segments of the bottom rail;

and each of said end pieces having a pair of laterally spaced generally T-shaped openings which receive said bottom rails, each of said openings in the end piece being wider at the top to enable endwise insertion of the corresponding bottom rail and narrower below to snugly receive the corresponding narrower vertically grooved segment of that bottom rail;

each of said end pieces having a horizontal stem projecting longitudinally inward between said laterally spaced openings in that end piece;

and the inverted U-shaped strip next to each end piece having an opening which snugly receives said stem.

4,600,111

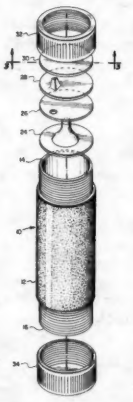
TODDLER CUP

Mary F. Brown, 301 W. Vilbig Rd., Irving, Tex. 75060

Filed May 13, 1985, Ser. No. 733,266

Int. Cl.[4] A47G *19/22;* **A47J** *41/00;* **A61J** *9/00;* **B65D** *23/12*

U.S. Cl. 215—6 **19 Claims**



1. A toddler drinking cup comprising:

a cylindrical member having an aperture at each end thereof;

a partition disposed within said cylindrical member, dividing said cylindrical member into a first compartment accessible through a first aperture, and a second compartment accessible through a second aperture;

a plurality of sealing lids each adapted to mate with said first aperture of said cylindrical member and adapted to fit within said second compartment of said cylindrical member;

a cap member for retaining said plurality of sealing lids within said second compartment, whereby said plurality of sealing lids are to be temporarily stored therein; and

wherein said drinking cup includes a lid cover member for retaining a selected one of said plurality of sealing lids in

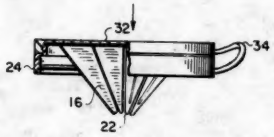
mated relationship with said first aperture of said cylindrical member.

4,600,112

ONE-WAY PASS-THROUGH CLOSURE

Richard A. Shillington, San Clemente, and Alec Oberschmidt, Leucadia, both of Calif., assignors to Med-Safe Systems, Inc., Encinitas, Calif.

Filed Nov. 19, 1984, Ser. No. 672,630
Int. Cl.[4] A61M 5/32
U.S. Cl. 215—274 8 Claims



1. A pass-through closure, comprising:

a circular peripheral supporting rim defining an opening, wherein said rim is substantially flat and circular in configuration and includes a planar area in which is formed a needle hub wrench;

a plurality of generally triangular shape panels reinforced by rib means to be substantially rigid, said panels being hinged at the base thereof to said rim and normally biased and extending inwardly toward the center and axially of said opening forming a generally conical configuration with the apex of each panel being rounded and terminating proximate the center of said opening for closing said opening; and

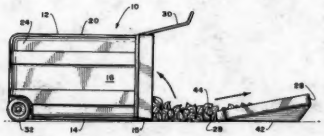
a permanent closure member for selectively engaging said supporting rim for selectively permanently closing said opening.

4,600,113

REFUSE CONTAINER HAVING SELF-CONTAINED SCOOP AND LID

Robert A. DeMars, 7932 Maestro Ave., Canoga Park, Calif. 91304

Filed Aug. 8, 1985, Ser. No. 763,538
Int. Cl.[4] B65D 90/00; B62B 1/00
U.S. Cl. 220—1 T 7 Claims



1. A refuse container comprising in combination:

(a) a body having a front wall, two sidewalls, and a rear wall, an open upper end and a lower portion, said front wall forming a scoop portion at its upper end;

(b) an accommodating lid, including a scoop means;

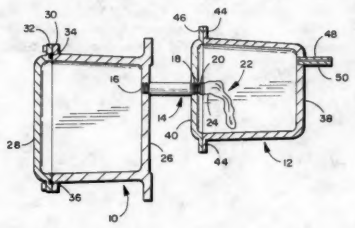
(c) an elongated pivotally disposed handle on said rear wall, adapted for pulling said refuse container while lying on its front wall.

4,600,114

THERMO EXPANSION COMPENSATOR

Robert M. Dabich, 7212 Patterson Dr., Garden Grove, Calif. 92641-1490

Filed Oct. 3, 1983, Ser. No. 538,188
Int. Cl.[4] B65D 90/22, 90/28; B65B 3/00; A16L 55/04
U.S. Cl. 220—85 B 7 Claims



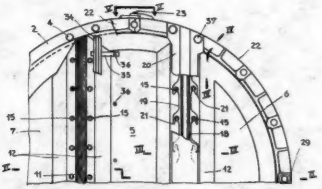
1. An explosion proof equipment vault comprising a totally enclosed, self-contained, rigid walled casing defining a cavity of fixed volume insensitive to changes in thermal conditions and occupied by a gas and defining a path of escape of expanding gas, a rigid walled auxiliary expansion chamber likewise defining a cavity of fixed volume pneumatically isolated from said explosing proof casing and in clear communication with ambient air, and an inelastic bladder disposed in said expansion chamber and in pneumatic communication with said explosion proof casing and in pneumatic isolation from ambient air, whereby said cavity of said auxiliary expansion chamber is totally occupied by said bladder and by a gas.

4,600,115

TEMPORARY OBTURATION PANEL OF A PASSAGE INSIDE A VESSEL ACCESSIBLE ONLY THROUGH AN ORIFICE OF SMALLER SIZE

Jean Coussau, Paris, and Claude Lavaleric, L'Isle Adam, both of France, assignors to Framatome & Cie, Courbevoie, France

Filed Nov. 1, 1984, Ser. No. 667,192
Int. Cl.[4] B65D 45/00
U.S. Cl. 220—327 4 Claims



1. Temporary fluid-tight obturation panel for a passage into a vessel accessible only through an aperture of dimensions less than those of the passage to be obturated, the periphery of the passage to be closed comprising a support collar provided with threaded holes, said obturation panel being constituted by:

at least two panels articulated together by flexible fluid-tight hinges, the size and number of panels being determined to enable passage through the access aperture of the set of panels folded on one another, each panel comprising along its articulated edges a series of latching pins,

a set of stiffeners equal in number to that of the hinges of the panel, each stiffener comprising two lines of holes conjugate with the lines of the latching pins of two contiguous panels,

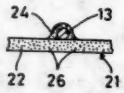
a frame in at least two parts articulated and foldable on one

another, reproducing in folded position the contour of the support collar and comprising means to grip, with the interposition of a seal, the ends of the panels and of the stiffeners against the support collar, by screwing into the threaded holes.

4,600,116
TAPE-MOUNTED ELECTRONIC COMPONENTS ASSEMBLY

Mitsumasa Inano, Kyoto, and Masaaki Okane, Takefu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Dec. 11, 1984, Ser. No. 680,648
Claims priority, application Japan, Dec. 19, 1983, 58-240348; Dec. 19, 1983, 58-240349
Int. Cl.⁴ B65D *73/02*
U.S. Cl. 206—330 **17 Claims**

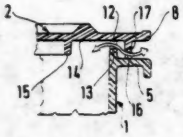


1. In a tape-mounted electronic components assembly comprising a support tape on which lead wires of a large number of electronic components are mounted, the improvement wherein the support tape is a synthetic resin tape, formed from thermoplastic synthetic resins to which inorganic fillers have been added and which inorganic fillers are uniformly distributed throughout the thermoplastic resins.

4,600,117
FOOD CONTAINER

Guy Tzifkansky, Fontenay Aux Roses, and Jean-Claude Marchais, L'Hay Les Roses, both of France, assignors to CIDELCEM, Paris, France

Filed Jul. 17, 1985, Ser. No. 755,989
Claims priority, application France, Jul. 20, 1984, 84 11574
Int. Cl.⁴ B65D *51/16*
U.S. Cl. 220—366 **3 Claims**

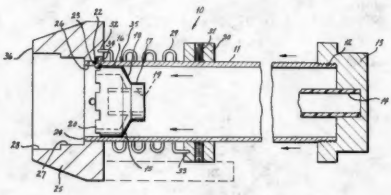


1. A vertically upwardly open food container having a substantially rectangular horizontal bottom and flared upright walls terminating in a substantially rectangular opening and including a horizontal rim near the top thereof which is outwardly rectangular in cross-section and which surrounds the opening to the container, and a vertical rib extending the walls above the rim, said container being provided with a horizontal cover overlying said opening including firstly a horizontal rim and secondly a vertical rib projecting beneath the rim and engaging around the vertical rib of the container, with the vertical rib of the container having substantially the same height as the vertical rib of the cover, the container including the improvement whereby the vertical rib of the container is fitted with notches on at least two sides of the container while the vertical rib of the cover includes lengths which are disposed adjacent the notches in one position of the cover and which are not disposed adjacent the notches in another position of the cover, said lengths being disposed to the outside of said notches and the bottom edges of said lengths being situated at a lower level than the bottoms of the notches, but higher than the horizontal rim of the container.

4,600,118
FERRULE DISPENSER

Gerald D. Martin, 301 Jackson, St. Charles, Mo. 63301

Filed Feb. 2, 1984, Ser. No. 576,478
Int. Cl.⁴ B65G *59/06*
U.S. Cl. 221—1 **12 Claims**



1. A method of placing stud welding throughbored ferrules onto a work surface to receive shear connectors therein comprising the steps of loading the ferrules into a disposable tubular magazine, positioning the tubular magazine adjacent to an elongated dispenser mechanism, said dispenser mechanism including an elongated rod and a releasible stop member adjacent to one end of said rod, locking the stop member in its released position, loading the ferrules in a stack from the magazine onto the elongated rod whereby the throughbores of the ferrules are passed over the rod, discarding the magazine, unlocking the stop member, engaging the lowermost ferrule of the stack with the releasible stop member to hold the stack onto the rod, selectively releasing the stop member to deposit only a single ferrule onto a preselected location on a work piece, and reengaging the stop means with the next lowermost ferrule in said stack to again restrain release of ferrules from the rod.

2. A dispenser for cylindrical articles comprising

(a) two elements relatively movable in a longitudinal direction,

(b) a stack of hollow cylindrical articles carried by one of said elements, each of said articles having an internal shoulder,

(c) a rocker arm engaging the internal shoulder of the forwardmost article in said stack for restraining the said article from leaving the stack when said rocker arm is in a first position,

(d) the other of the relatively movable elements being an actuating rod positioned within the hollow centers of said articles and pivotably connected to the rocker arm for pulling the rocker arm through the center of the articles to a second position to release the lowermost article from said stack, and

(e) means for returning the rocker arm to its first article engaging position.

4,600,119
HELICAL COIL DISPENSING MACHINE APPARATUS

Wayne L. Olson, Keystone Rte., Box 7006, Rapid City, S. Dak. 57701

Filed Jul. 19, 1984, Ser. No. 632,307
Int. Cl.⁴ G07F *11/36*
U.S. Cl. 221—75 **14 Claims**

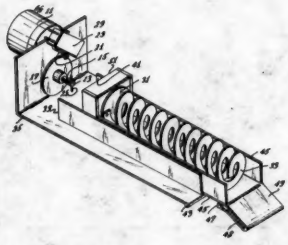
1. Dispensing apparatus for dispensing articles, comprising:

a dispensing station which has a channel for holding a dispensing tray;

an elongated dispensing tray having an open end and a bottom for supporting the articles to be dispensed, the tray also having a tray latching bar that has an upper surface and is disposed beneath the tray adjacent the bottom

thereof and extending transversely thereto, the upper surface of the latching bar being spaced from the bottom of the tray;

a station latching bar on the underside of said dispensing station, which station latching bar is so positioned that when the dispensing tray is placed into position in said channel on said dispensing station, said station latching bar will latch with the tray latching bar extending beneath the bottom of surface of said tray, thereby holding the dispensing tray tightly in position in the dispensing station;



a spiral ejector positioned horizontally within the dispensing tray, one end of which ejector extends to the open end of said tray;

an end piece disposed in the dispensing tray and having a hole therethrough;

means to rotate the ejector on its axis through a predetermined angular displacement each time an activating compound is received; and

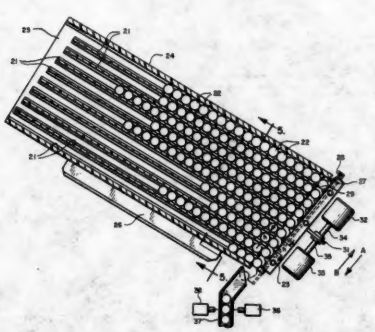
coupling means, extending through the hole in the end piece, for coupling the ejector to the rotating means.

4,600,120

MAGAZINE FOR DISPENSING CARTRIDGES INTO AN AUTOMATED ANALYZER

Michael K. Sabo, Glenview, and Gary R. Johnson, Algonquin, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 19, 1984, Ser. No. 662,669
Int. Cl.[4] B65G *59/00, 47/04;* B65H *1/00*
U.S. Cl. 221—107 **19 Claims**



1. A magazine for controllably dispensing generally cylindrical objects, the magazine comprising:

a plurality of shelves positioned parallel to each other, each of the shelves being configured so as to allow a plurality of the objects to move along its surface, each of the shelves being spaced from another of the shelves at a first distance greater than the greatest diameter of the objects, each of the shelves having a substantially linear edge, and all of said linear edges being generally aligned in a first plane;

a ratcheting plate with a major surface arranged such that the major surface faces the first plane, is generally parallel to the first plane, and is at a second distance from the first plane which is greater than the greatest diameter of the objects, said major surface comprising a plurality of surface features configured and arranged such that the objects can move along the major surface with less resistance in a first direction which is perpendicular to the shelves than in a second opposite direction;

means for reciprocally moving the ratcheting plate in said first and second directions a third distance greater than the greatest diameter of the objects; and

means for moving the objects along the shelves toward the ratcheting plate;

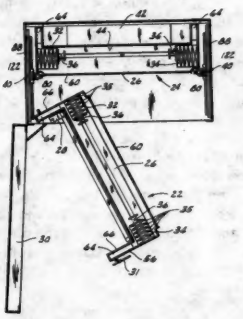
wherein the surface features of the major surface of the ratcheting plate comprise a series of parallel adjacent grooves running in a direction parallel to the linear edges of the shelves, each of said grooves being comprised of a first and second wall, each of said first walls being oriented generally at a first internal angle relative to the first plane, and each of said second walls being oriented generally at a second internal angle relative to the first plane, said second angle being greater than said first angle whereby one of said objects may pass over said first wall in said first direction with less resistance than it may pass over said second wall in said second direction.

4,600,121

ARTICLE VENDOR

Leonard P. Falk, Florissant, and Robert L. Stadler, Overland, both of Mo., assignors to UniDynamics Corporation, Stamford, Conn.

Filed Oct. 9, 1984, Ser. No. 658,605
Int. Cl.[4] G07F *11/42*
U.S. Cl. 221—130 **17 Claims**



13. An article vendor, comprising:

a cabinet having a front, a rear and right and left sides;

a plurality of vertically stacked horizontal magazines mounted in the cabinet and forming two laterally spaced vertical banks extending from the right to the left side of the cabinet, each magazine being formed for horizontal discharge from both end portions thereof of articles disposed thereon, and means for urging different ones of the articles towards both end portions, the magazines having means at both end portions of each magazine for preventing the article from being expelled from the magazines solely by the urging means;

article ejection means mounted for vertical and horizontal movement across the magazines adjacent said both end portions of the magazines and engagable with a selected one of the articles located at one of the end portions of one

of the magazines for laterally urging the selected article off of said one magazine;

article delivery means disposed beneath said both end portions of a lowermost of the magazines in each bank for catching the articles as they are urged off of the magazines and delivering them to a predetermined location, and

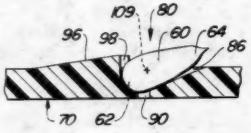
electronic control means having a manually operable control means for selecting a desired article, programmable control means for knowing addresses of all end portions of the magazines and which articles are disposed at each address, means for controlling movement of the article ejection means for moving it to an address of a selected article so as to urge the selected article off of a one of the magazines on which the selected article is disposed.

4,600,122

SEED METER DISK FOR USE WITH SUNFLOWER AND OTHER SEEDS OF LONG, SLENDER SHAPE

William R. Lundie, East Moline, and Jay H. Olson, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Mar. 23, 1984, Ser. No. 592,898
Int. Cl.[4] B65G *29/00*
U.S. Cl. 221—211 **12 Claims**



1. A seed disk of relatively thin and flat configuration having a plurality of spaced-apart recesses in a side surface of the disk arranged in a circular path around the disk, a plurality of apertures in the disk, each of the apertures extending through the disk from a different one of the recesses, and a plurality of projections in the side surface of the disk along the circular path, each of the projections extending outwardly from the side surface at an edge of a different one of the recesses, each of the recesses having a rear wall thereof located in the circular path and each of the projections having a surface thereof forming a continuation of a portion of the rear wall of a different one of the recesses, the circular path having a center at an axis of rotation of the disk, the rear wall of each recess extending around one of the apertures which extends through the disk from the recess from an outer location on the opposite side of the aperture from the center of the circular path to an inner location on the same side of the aperture as the center of the circular path, and the surface of one of the projections forming a continuation of a portion of the rear wall being curved and extending around the aperture along a substantial portion of the rear wall.

4,600,123

PROPELLANT AUGMENTED PRESSURIZED GAS DISPENSING DEVICE

Lyle D. Galbraith, Redmond, Wash., assignor to Rocket Research Company, a division of Rockor, Inc., Redmond, Wash.

Filed Dec. 16, 1982, Ser. No. 450,354
Int. Cl.[4] F16K *17/40*
U.S. Cl. 222—3 **10 Claims**

1. In a propellant augmented gas dispensing device including:

means defining a gas chamber,

means defining a propellant chamber,

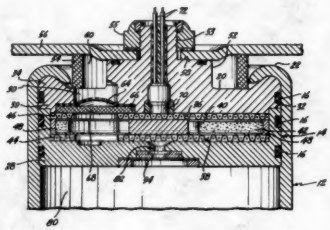
means defining a first flow passage between said gas and propellant chambers, and

means defining an exhaust passage from said propellant chamber,

an improved pressure relief assembly for said gas chamber comprising:

a burst disc positioned across said first flow passage for preventing flow therethrough, said burst disc having a propellant side and a gas side, and

a support member affixed to said device and located on the propellant side of and in supporting contact with said burst disc, said support member having a central opening communicating with said first flow passage, said disc spanning said central opening and having a zone of weakness surrounding and being located radially outwardly



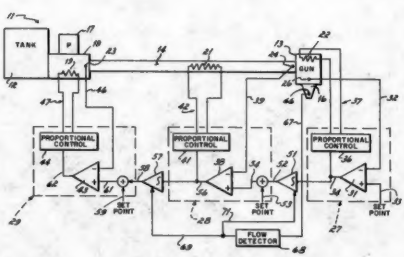
from said central opening, said burst disc being substantially supported by said support member in the region adjacent and radially inwardly from said zone of weakness, said disc and said central opening cooperating to allow said disc to rupture in the region adjacent said central opening upon occurrence of a predetermined high pressure in said gas chamber to release the gas in said gas chamber to said exhaust passage, said disc being capable of rupturing along said zone of weakness when the pressure difference between said propellent chamber and said gas chamber exceeds a predetermined low pressure on said propellant side.

4,600,124

CONTROLLED TEMPERATURE HOT MELT ADHESIVE DISPENSING SYSTEM

Richard P. Price, Parma Heights, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 8, 1985, Ser. No. 731,933
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—54 **4 Claims**



1. A controlled temperature fluid dispensing system comprising:

a flow path for fluid from an upstream fluid source to a downstream fluid dispenser;

a first closed loop temperature control arrangement for a first location along the flow path including a first heater for fluid in the flow path, a first temperature sensor for sensing the temperature of fluid in the flow path, and a first heater controller, coupled to the first heater and to

the first temperature sensor, for comparing, in a first comparison, the temperature sensed by the first temperature sensor with a first setpoint temperature and for controlling the activation of the first heater based upon the result of said first comparison to tend to maintain the temperature sensed by the first temperature sensor at the first setpoint temperature;

a second closed loop temperature control arrangement for a second location, upstream from the first location, along the flow path including a second heater for fluid in the flow path, a second temperature sensor for sensing the temperature of fluid in the flow path, and a second heater controller, coupled to the second heater and to the second temperature sensor, for comparing, in a second comparison, the temperature sensed by the second temperature sensor with a second setpoint temperature and for controlling the activation of the second heater based upon the result of said second comparison to tend to maintain the temperature sensed by the second temperature sensor at the second setpoint temperature;

a third closed loop temperature control arrangement for a third location, upstream from the first and second location, along the flow path including a third heater for fluid in the flow path, a third temperature sensor for sensing the temperature of fluid in the flow path, and a third heater controller, coupled to the third heater and to the third temperature sensor, for comparing, in a third comparison, the temperature sensed by the third temperature sensor with a third setpoint temperature and for controlling the activation of the third heater based upon the result of said third comparison to tend to maintain the temperature sensed by the third temperature sensor at the third setpoint temperature;

first feedback means coupled between the first heater controller and the second heater controller, for adjusting one of (a) the temperature sensed by the second temperature sensor, (b) the second setpoint temperature, and (c) the result of said second comparison, to produce an adjusted second comparison result used by the second heater controller for controlling the activation of the second heater; and

second feedback means, coupled between the second heater controller and the third heater controller, for adjusting one of (a) the temperature sensed by the third temperature sensor, (b) the third setpoint temperature, and (c) the result of said third comparison, to produce an adjusted third comparison result used by the third heater controller for controlling the activation of the third heater.

4,600,125

LIQUID FUNNEL AND POURING SPOUT COMBINATION

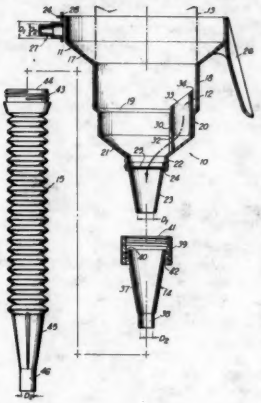
Walter P. Maynard, Jr., 8613 Roswell Rd., Building Two, Suite 100, Atlanta, Ga. 30338

Continuation of Ser. No. 523,017, Aug. 15, 1983, abandoned. This application Sep. 3, 1985, Ser. No. 771,488

Int. Cl.[4] B67B *7/48*; B67C *11/00*

U.S. Cl. 222—81 **1 Claim**

1. A pouring system for containerized liquids comprising a primary funnel having a receiver chamber for a liquid container and a container piercing means projecting into said chamber, a pouring spout of a first diameter on the primary funnel, said funnel having a threaded coupling neck near said spout, a secondary pouring spout of smaller diameter than the first-named spout adapted to engage telescopically thereover and having an attached coupling including a first threaded portion engageable with the threaded coupling neck and a second threaded portion, and a tertiary elongated flexible pouring spout which is telescopically engageable over the secondary spout, the tertiary spout having a screw-threaded coupling part which is engageable with the second threaded portion of said attached coupling of the secondary pouring spout, said first and second threaded portions sized to optionally fit in threaded engagement with a standard size container, such that said secondary pouring spout may also be used as a spout for said standard size container, said secondary pouring spout combined with said tertiary elongated pouring spout



may be used as an elongated spout for said standard size container, and said funnel combined with said secondary pouring spout may be connected to said standard size container to form a sealed funnel connection with said standard size container.

4,600,126

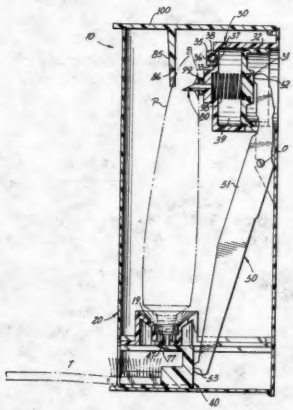
TOOTHPASTE EXTRACTOR

Aurelia Arango, Dade County, Fla., assignor to Miguel A. Arango, Miami, Fla.

Continuation-in-part of Ser. No. 6,459,390, Jan. 20, 1983, Pat. No. 4,508,240. This application Oct. 1, 1984, Ser. No. 655,752

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—82 **5 Claims**



1. A dispenser of the toothpaste from a tube, manually operated by a user by inserting a toothbrush, comprising, in operative combination:

A. a housing having a collar seat for said tube and a nozzle in alignment with the opening of said tube;

B. pneumatic means for compressing air mounted within said housing and including a one-way valve and syringe means adapted to penetrate said tube so that air is allowed inside

said pneumatic means through said valve and injected out through said syringe means and inside said tube when said pneumatic means is activated;

C. carrier means slidably mounted within said housing and adapted to receive said toothbrush;

D. linkage means for transmitting the motion applied on said carrier means by the user through said toothbrush to actuate said pneumatic means so that compressed air is injected inside said tube thereby forcing a predetermined amount of toothpaste out through said nozzle and deposited on said toothbrush.

4,600,127

DISPENSING TAPS

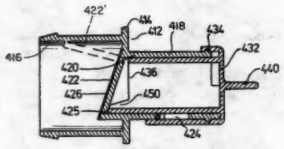
Jon H. Malpas, P.O. Box 10, Leopold Victoria, Australia (3221), and Alan R. Calder, 13 Pavo Street, North Balwyn Victoria, Australia (3104)

Division of Ser. No. 485,702, Apr. 18, 1983. This application Feb. 28, 1985, Ser. No. 706,736

Claims priority, application Australia, Apr. 30, 1982, PF3796; May 5, 1982, PF3867; Jun. 23, 1982, PF4561; Feb. 21, 1983, PF8126

Int. Cl.[4] B67B *7/48*

U.S. Cl. 222—83 **3 Claims**



1. A tap having a body and spigot, said body being adapted to receive said spigot, said body having an outer end and an inner end, said inner end being closed by sealing means, said sealing means including an inclined diaphram inclined with respect to the longitudinal axis of said body having a hinge at the portion thereof closest to said body outer end, whereby said diaphram is adapted to pivot only inwardly relative to said inner end, said spigot constituting actuating means for causing said pivoting said spigot having a cam on its inner edge, whereby rotatable movement of said spigot relative to said body opens said diaphram by said cam acting on said diaphram.

4,600,128

CLEANSER CONTAINER

Hermann Rohrer, Münsingen, Switzerland, assignor to Sipuro A.G., Münsingen, Switzerland

Filed Nov. 15, 1984, Ser. No. 672,293

Claims priority, application Switzerland, Nov. 25, 1983, 6325/83

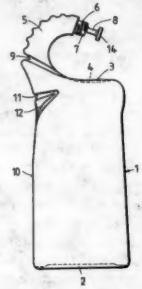
Int. Cl.[4] B67D *1/16*

U.S. Cl. 222—108 **6 Claims**

1. A container for liquid or dry cleanser, particularly toilet-bowl cleanser, of the type having a bottom, at least one sidewall, a top wall situated opposite said bottom, a neck portion projecting from said top wall in the vicinity of said sidewall and including an outlet opening at the end of said neck portion remote from said top wall, said neck portion bent arcuately so as to exhibit a change of direction of 80°–110°, an insert piece introduced into said outlet opening of said neck portion and having a duct passing therethrough, wherein the improvement comprises

a depression in said top wall, the end of said insert piece remote from said neck portion being situated approximately above the middle of said depression, and wherein said top wall slopes away from said bottom in the area of the base of said neck portion;

a groove partially encircling said neck portion at the base thereof and leading to said depression;



a transverse groove running substantially horizontally in said sidewall below the base of said neck portion and two longitudinal grooves, each extending downward in said sidewall from a respective end of said transverse groove.

4,600,129

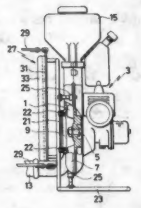
CHEMICALS SPREADER

Keiji Kondo, Higashiyamato, Japan, assignor to Komatsu Zenoah & Co., Japan

Filed Jan. 30, 1984, Ser. No. 575,196

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—175 **5 Claims**



1. A chemicals spreader to be carried on the back of an operator comprising:

a chemicals reservoir containing chemicals,

a fan for blowing air,

means for introducing said chemicals into the air stream caused by said fan to make a mixture thereof,

means for spreading said mixture of said chemicals and said air,

a pack board having a front side for abutting the back of the operator,

means adjacent to said pack board for supporting said fan, and

means provided in said pack board for passing and distributing part of the air stream caused by said fan onto the back of the operator.

4,600,130

SQUEEZE PRESSURE DISPENSER WITH INTEGRAL SIPHON TUBE

Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

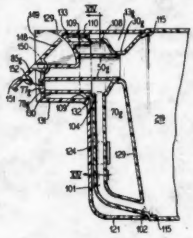
Filed Sep. 29, 1983, Ser. No. 536,727

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—209 **20 Claims**

1. A dispensing container and cap combination comprising a molded plastic container having a main body portion with an interior, a dispensing tube portion with an interior, and a neck portion, the neck terminating in an open end, the neck portion having a filling opening to the main body portion interior and a separate opening to the tube portion interior, the separate

openings being spaced below the open end of the neck portion, the tube portion formed integrally with the main body portion and having a first end open to an interior of the main body portion adjacent a bottom thereof and a second end, spaced from the first end open to the separate opening, the tube portion intermediate the first and second ends being separated



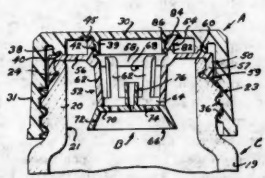
from the interior of the main body portion, a cap adapted to be received on said container including means closing the filling opening to the neck portion, the cap having means effective to divide the neck poriton into a dispensing passageway and a stopper for the main portion, said cap having a dispensing opening communicating with the dispensing passageway.

4,600,131

POUROUT FITMENT/CLOSURE

William M. Roof, Louisville, and Dennis P. Blair, Prospect, both of Ky., assignors to Thoroughbred Plastics Corp., Louisville, Ky.

Filed Nov. 30, 1983, Ser. No. 556,754
Int. Cl.[4] C65D *25/40*
U.S. Cl. 222—478 **57 Claims**



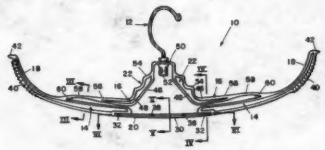
1. A pourout fitment/closure for use on a container including a tubular neck defining a pourout opening for the container and configured for attachment of said fitment/closure thereto; said fitment/closure including retaining means for releasable interconnection of said fitment to said closure so that said fitment/closure can be applied as a single unit to the tubular neck of the container, said retaining means being operable to release said closure from said fitment when said closure is removed from the tubular neck of the container; said fitment including a flanged disk-like body portion having means for attachment of said fitment to the tubular neck of the container and over the pourout opening thereof, a generally cylindrical hub portion depending from said flanged disk-like body portion to within the pourout opening of the tubular neck of the container and providing a flowway for regulating the rate of flow and dispersion of liquid as poured from the container, and a tubular portion comprising a pouring spout intercommunicating with said flowway of said hub portion for receiving liquid therefrom as poured from the container; said hub portion having a plurality of spaced circumferential windows opening into said flowway thereof for regulating the rate of flow of liquid into said flowway, a bottom wall for diverting liquid flow thereabout and through said windows, and a center post of orbicular cross section mounted substantially centrally on said bottom wall and extending to within said flowway in a spaced apart relation to and confronting said windows for dispersing the liquid pour as it passes through said windows and through said flowway; and said closure includes a top portion having a depending skirt provided with means for removable attachment of said closure to the tubular neck of the container and over the pourout opening thereof, and means cooperatively interacting with said fitment for providing a substantially liquid tight seal over the pourout opening of the container when said closure is attached thereto.

4,600,132

ADJUSTABLE HANGER

Russell O. Blanchard, Zeeland, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.

Filed Apr. 24, 1985, Ser. No. 726,613
Int. Cl.[4] A47G *25/30*
U.S. Cl. 223—95 **20 Claims**



1. A garment hanger, comprising:

a pair of opposed support arms having garment engaging outer ends:

means joining said support arms connected with and extending between the inner ends of said support arms;

a pair of interconnected lever arms above said support arms and having distal ends pivotally secured to said support arms, said lever arms being rigid over a substantial portion thereof and having a hinged interconnection to each other adjacent the center of the hanger to provide said distal ends with the ability to be converged and diverged; and

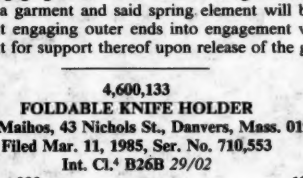
said joining means including an elongated resilient spring element in the medial area between said support arms, and cooperating with said hinged interconnection to permit said support arms to pivot upwardly and converge said garment engaging outer ends, said spring element biasing said garment engaging outer ends to diverge and, said support arms to shift outwardly and toward an opposed planar position, each of said lever arms having an upwardly extending segment adjacent said hinged interconnection, said segments being adjacent each other to form an upwardly extending grip whereby said garment engaging outer ends can be converged for insertion within a garment and said spring element will bias said garment engaging outer ends into engagement with the garment for support thereof upon release of the grip.

4,600,133

FOLDABLE KNIFE HOLDER

Michael G. Maihos, 43 Nichols St., Danvers, Mass. 01923

Filed Mar. 11, 1985, Ser. No. 710,553
Int. Cl.[4] B26B *29/02*
U.S. Cl. 224—232 **13 Claims**



1. A holster for a foldable knife, said knife having a handle and a blade pivotably mounted to said handle, comprising a

holster having a cam-fulcrum therein which bridges a forward portion of said holster proximate the exit for the handle of said knife, said holster having a chamber therein to receive and hold said knife in a partially-folded position around said cam-fulcrum, such that on withdrawal of said knife from said holster, said blade contacts and pivots around said cam-fulcrum and opens relative to said handle, so that said knife is withdrawn from said holster in an open position.

4,600,134

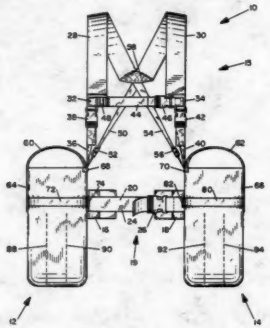
DUAL CARRYING POUCH

Jeffrey S. Colby, 5985 Glencoe Rd., Excelsior, Minn. 55331

Filed Nov. 15, 1984, Ser. No. 671,788

Int. Cl.[4] A45F *3/04*

U.S. Cl. 224—260 **2 Claims**



1. Dual mail carrying pouches for utilization by a mail person delivering mail comprising:

a. like opposing mirror image mail pouches, each pouch including a rectangular bottom, four joined sides and an overlapping flap secured to a back side of said pouch for covering an opening of said pouch, said back side adjacent to said person's hip, and an inside of said flap and a front side of said pouch including a velcro fastening means;

b. waist belt including opposing hip pads, a back waist belt and belt strap adjuster connected between said hip pads, said back waist belt and belt strap adjuster encompassing said person's back area of said person's waist, and a front waist belt and adjustable strap buckle connected between said hip pads, each of said hip pads secured to a mid-portion of said back side of each of said pouches;

c. padded shoulder straps for resting on said person's shoulder, and joined at a rear shoulder strap crossing junction at a substantially mid-portion of said person's back, back straps and back strap adjusters joined at said crossing junction and connected above a rearward edge of said hip pd and along a top inner edge adjacent said person's side of of said pouches, and spaced inwardly along said top inner edge of each of said pouches from a rear vertical inner side seam of each of said pouches and front adjustable strap buckles connected between said shoulder straps and connected above a forward edge of said hip pad along a top edge of each of said pouches and spaced inwardly along said top inner edge of each of said pouches from a forward vertical inner side seam of each of said pouches whereby a geometrical relationship of connection of said back straps to each of said pouches is symmetrical to a geometrical relationship of connection of said front straps to each of said pouches; and,

d. horizontal pectoral belt and an adjustable strap buckle connected at each junction of said shoulder straps and said front straps for resting about a front chest area of said person, whereby said mail person orientates said waist belt about their waist and positions the back straps about their back.

4,600,135

NAIL DRIVING TOOL

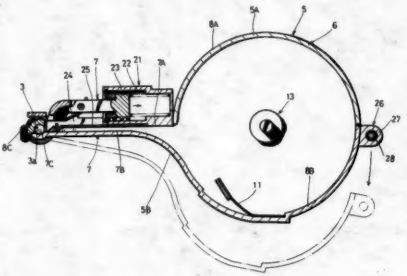
Kenji Mukoyama, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan

Filed Dec. 27, 1984, Ser. No. 686,754

Claims priority, application Japan, Dec. 29, 1983, 58-202249[U]

Int. Cl.[4] B25C *1/04, 7/00*

U.S. Cl. 227—120 **7 Claims**



1. A tool for driving nails into a workpiece comprising:

a housing including a reciprocable driver;

a driver guide fixedly connected to and extending vertically from the lower end of said housing for slidably receiving said driver therein and including a driver track portion;

a handle secured to and extending laterally outwardly from the central portion of said housing; and

a magazine including a storing portion adapted to receive a nail package including a multiplicity of nails interconnected in series and a nail guiding portion adapted to guide the leading portion of the nail package to said driver guide, said magazine including a fixed wall portion secured at one end to said driver guide and extending generally below and parallel with the longitudinal extent of said handle and a closure wall portion including integral nail guiding and nail storing components defining at least a part of the driver track of the driver guide pivotally movable about said driver guide with respect to said fixed wall portion between an operative closed position and an open position exposing the interior of said magazine, and locking means for retaining said closure wall portion on said fixed wall portion when said closure wall portion is in its operative closed position.

4,600,136

INSTALLATION FOR ASSEMBLING AND IN PARTICULAR PINNING CAR BODIES OF MOTOR VEHICLES

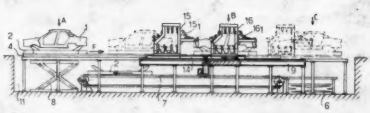
Mario Sciaky, Paris; Michel Leonard, Maisons Alfort; Pierre Jablonski, Creteil, and Jean-Jacques Marianne, Combs la Ville, all of France, assignors to Sciaky S.A., Vitry sur Seine, France

Filed Jan. 10, 1985, Ser. No. 690,339

Claims priority, application France, Jan. 11, 1984, 84 00373

Int. Cl.[4] B23K *37/02, 37/04*

U.S. Cl. 228—45 **3 Claims**



1. Installation for the assembly and in particular for the

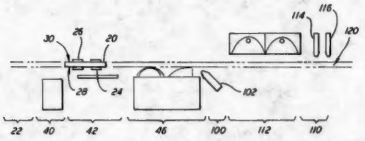
pinning of car bodies of motor vehicles comprising carriages for supporting the car bodies which are to be assembled by welding, and means for displacing said carriages to an assembly station provided with welding equipment, said installation comprises a rigid and fixed stand, a rigid frame which reciprocates on the stand in a direction parallel to the movement of the carriages and at least two gantries rigidly fixed to said frame, each said gantry comprising positioning and holding means for a particular model of car body to be welded, means for reciprocating the frame on the stand in a direction parallel to displacement of the carriages and means for locking the frame in relation to the stand so as to position one of the gantries in the assembly station.

4,600,137

METHOD AND APPARATUS FOR MASS SOLDERING WITH SUBSEQUENT REFLOW SOLDERING

Matthias F. Comerford, Newton Highlands, Mass., assignor to Hollis Automation, Inc., Nashua, N.H.

Filed Feb. 21, 1985, Ser. No. 703,735
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—102 **14 Claims**



1. Apparatus for mass joining with solder electrical and electronic components affixed on a circuit board and populating both the top side surface of the board and the bottom side surface of the board, and comprising in combination:

a mass soldering station adapted a deposit a quantity of molten solder onto the bottom side surface of said board and any components affixed thereto whereby to electrically and mechanically join said components to the bottom side of said board;

a solder reflow station adapted to heat the top side surface of said board sufficient to reflow solder preforms and/or solder paste or cream thereon whereby to electrically and mechanically join any components thereon to the top side surface of said board; and

means for transporting said circuit board in line between said mass soldering station and said solder reflow station in timed sequence, said timed sequence being adjusted to bring said board into said reflow station at or near the time at which heat transfer through said board has reached its maximum amount.

4,600,138

BONDING TOOL AND CLAMP ASSEMBLY AND WIRE HANDLING METHOD

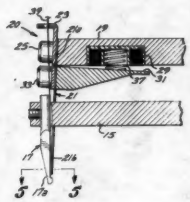
William H. Hill, Rancho Santa Fe, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1984, Ser. No. 634,237
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—179 **10 Claims**

1. A bonding tool and clamp assembly for handling bonding wire relative to a workpiece, comprising:

a bonding tool having a bonding foot with a heel;

guiding means cooperating with said bonding tool for guiding the bonding wire substantially perpendicularly with respect to the workpiece; and



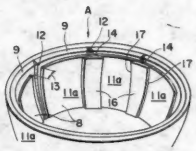
clamping means cooperating with said bonding tool for selectively clamping the bonding wire against a clamping surface on said bonding tool near said bonding foot heel.

4,600,139

METHOD OF MAKING CORROSION-RESISTANT END PLATE OF CLADDING TYPE FOR HIGH PRESSURE VESSEL

Noriyoshi Murase, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 16, 1983, Ser. No. 523,437
Int. Cl.[4] B23K *31/02*; F16J *12/00*
U.S. Cl. 228—184 **2 Claims**



1. A method of forming a corrosion-resistant cladding type end plate for a high pressure vessel, comprising:

forming a cup-shaped solid pressure resistant vessel having a curved internal surface;

welding a corrosion-resistant member to each of a plurality of base cladding member segments to form cladding segments, edges of said corrosion resistant members being spaced from edges of said base cladding member segments;

curving said base cladding segments with a shape corresponding to an internal shape of said pressure-resistant vessel;

forming said cladding segments into a cladding member welded into said pressure resistant vessel with edges of said base cladding member segments defining joints welded to one another and said corrosion-resistant members spaced from one another at said joints;

welding dead plates of the same material as said corrosion-resistant members into said spaces by welding to said corrosion-resistant members;

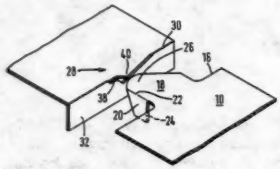
covering said dead plates with patches; and

welding said patches to said corrosion-resistant members.

4,600,140
INTERLOCK BETWEEN PANELS

André Milliens, Etrechet, France, assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 18, 1985, Ser. No. 692,599
Claims priority, application United Kingdom, Jan. 20, 1984, 8401610
Int. Cl.⁴ B65D *5/42*
U.S. Cl. 229—48 R **13 Claims**

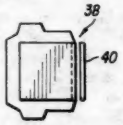


1. An arrangement for securing together a pair of panels, said arrangement comprising a locking tab projecting from an end edge of one of said panels and a locking slit provided adjacent an end edge of the other of said panels, the locking tab and the locking slit being interengaged by relative sliding movement therebetween, said locking tab having a lead main portion and a trailing edge portion and including an anchoring tab hinged along a fold line to one side edge of said main portion of the locking tab and the locking tab being sized for insertion into said locking slit when the anchoring tab has been folded into overlapping relationship with said main portion of the tab, said locking slit being disposed along a fold line spaced inwardly from, and extending substantially parallel to, the end edge of said other panel and defining a foldable edge strip said locking slit and said edge strip being arranged so as to provide an abutment edge on said edge strip to be engaged by the trailing edge portion of said locking tab when the locking tab has been inserted into the locking slit.

4,600,141
MAILING ENVELOPE AND INSERT SUBASSEMBLY

William P. Bradley, Hollidaysburg, Pa.; Michael Herman, Bedford Hills, and Robert W. Paltrow, Bedford, both of N.Y., assignors to Bedford Engineering Co., Armonk, N.Y.

Division of Ser. No. 464,648, Feb. 7, 1983, Pat. No. 4,530,730. This application Apr. 18, 1985, Ser. No. 724,437
Int. Cl.⁴ B65D *27/14*
U.S. Cl. 229—92.7 **1 Claim**

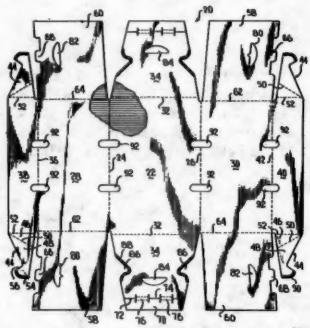


1. A mailing sub-assembly comprising
a once-folded sheet having an envelope portion and an enclosure portion;
said once-folded sheet comprising two layers of sheet material wherein one layer is said envelope portion and the other layer is said enclosure portion;
said single sheet having a single scoreline, said single scoreline being located between said envelope portion and said enclosure portion and forming the fold-line of said once-folded sheet said single scoreline being parallel to one edge of said enclosure portion;
fugitive adhesive located along a line substantially between said envelope portion and enclosure portion, said ahesive being closer to said single scoreline than to said parallel edge of said enclosure portion said fugitive adhesive having tack when wet and no tack when dry; and
said envelope portion having a pair of side flaps and a seal flap, said side flaps located nearer to said seal flap than to said single score line.

4,600,142
REVERSE ELBOW LOCK FLAP PRODUCE BOX

Benjamin W. Quaintance, Griffin, Ga., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 574,496, Jan. 27, 1984, abandoned. This application Nov. 15, 1984, Ser. No. 671,826
Int. Cl.⁴ B65D *5/20*
U.S. Cl. 229—143 **24 Claims**



1. A box, said box comprising a bottom panel having connected to opposite sides thereof side panels hinged thereto, an end panel hingedly connected to each end of said bottom panel, a top closure panel hingedly carried by a hinge line by each of said side panels remote from said bottom panel, and a lock panel hingedly carried by each end of said closure panels along a transverse hinge line for folding into overlapping relation with a respective one of said end panels, each lock panel being formed in two sections connected along a diagonal hinge line, each lock panel terminating in a hook and each of said end panels having a lock notch receiving a respective one of said hooks, said diagonal hinge line forming means for permitting transverse swinging movement of said hook into its respective lock notch after the corresponding closure panel has been moved to a top forming position and after said respective lock panel has been pivoted about the respective one of said transverse hinge lines.

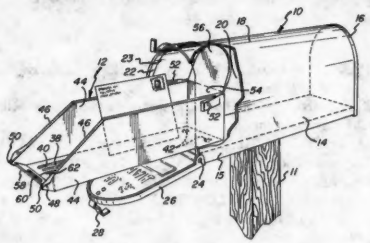
4,600,143
SLIDABLE TRAY INSERT FOR MAILBOXES

Albert L. Harlow, Jr., 20 Chelsea St., Fairfield, 06430 and Arthur M. Felske, Caulkins Town Rd., Sharon, 06069, both of Conn.

Filed Feb. 15, 1985, Ser. No. 702,060
Int. Cl.⁴ B65P *91/00*
U.S. Cl. 232—17 **32 Claims**

1. A slidable tray insert for use in combination with a rural mailbox having a bottom panel, a back panel and a U-shaped roof portion defining an enclosure with an entrance opening at one end thereof, and a door member pivotally mounted adjacent said entrance opening for movement between an open position permitting access to the enclosure through the entrance opening and a closed position covering the entrance opening, comprising: a generally rectangular bottom wall, a pair of side walls extending upwardly from said bottom wall, an end wall extending upwardly from said bottom wall and transversely between said side walls, and a handle disposed on said bottom wall opposite said end wall and spaced from said

side walls, said handle normally inclined upwardly from said bottom wall and being connected to the bottom wall by resil-



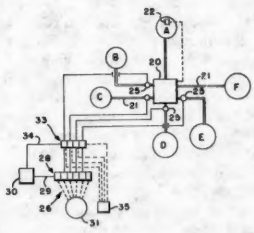
ient hinge means permitting pivoting movement of said handle from its upwardly inclined position to a position flush against the bottom panel of the mailbox.

4,600,144

ZONE CONTROL APPARATUS FOR CENTRAL HEATING AND/OR COOLING SYSTEMS

Alex Zelczer, 3840 Severn Rd., Cleveland Hts., Ohio 44118

Division of Ser. No. 554,952, Nov. 25, 1983, Pat. No. 4,545,524.
This application Jul. 22, 1985, Ser. No. 757,526
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—46 R **1 Claim**



1. A method for controlling the flow of conditioned fluid from a central heating and/or cooling system through conduits normally directing the conditioned fluid to respective zones for conditioning the environment thereof by means of a zone control apparatus including a plurality of flow control devices operatively associated with respective conduits and a cycle controller for automatically cycling each flow control device between high and low flow conditions at preselected times, said method comprising the steps of strategically grouping the zones into a day activity group and a night activity group such that the flow control devices associated with the day and night activity groups respectively will be in their high and low flow conditions during the day and in their low and high flow conditions during the night, and then cycling the flow control devices associated with each group by means of the controller to their low flow conditions after the flow control devices associated with the other group are cycled to their high flow condition to provide an overlap in day and night service.

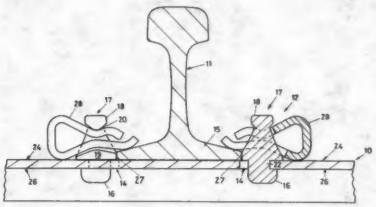
4,600,145

RAILROAD SLEEPER LOCK-IN SHOULDER

Norman R. Geddes, Seaview Downs, Australia, assignor to Omark Industries, Inc., Portland, Oreg.

Filed Dec. 7, 1983, Ser. No. 559,307
Claims priority, application Australia, Dec. 7, 1982, PF7156
Int. Cl.[4] E01B *9/34*
U.S. Cl. 238—351 **17 Claims**

1. A railroad sleeper lock-in shoulder usable on a sleeper having an aperture therethrough, said shoulder having a head at its upper end, sleeper abutment means intermediate its ends, a neck joining the head to the sleeper abutment means, a rail engaging surface which, upon assembly, engages a rail foot edge, a retaining block at its lower end and a stem located beneath the head and depending from the sleeper abutment means to the retaining block, a back surface of the stem, said sleeper abutment means and retaining block having respec-



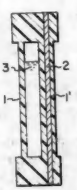
tively downwardly and upwardly facing surfaces which, with said stem back surface, define a slot, said downwardly and upwardly facing surfaces being engageable respectively with the upper and under surface of said sleeper when the retaining block is inserted through said aperture therein and moved laterally to engage said back surface with a surface of said sleeper aperture.

4,600,146

SUSTAINEDLY VAPOR-RELEASING BODY HAVING EXCELLENT SHAPE-RETAINABILITY

Shigeru Ohno, Kanagawa, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,759
Claims priority, application Japan, Mar. 24, 1981, 56-42879
Int. Cl.[4] A61L *9/04*
U.S. Cl. 239—6 **10 Claims**



1. A sustainedly vapor-releasing integrated body having excellent shape-retainability which comprises

(a) a capillary tubing sealed at both ends and having flexibility made of a polymeric material,

(b) a metal wire having plastic deformability to retain a deformed configuration and integrated with the capillary tubing in a side-by-side manner along the longitudinal direction thereof, and

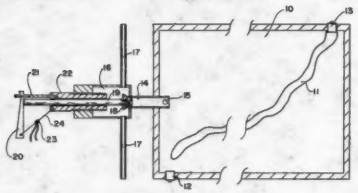
(c) a vaporizable substance filling the pore of the capillary tubing, which is capable of vaporizing through the walls of the capillary tubing and exhibiting an activity in the vapor phase.

4,600,147

LIQUID PROPANE GENERATOR FOR CLOUD SEEDING APPARATUS

Norihiko Fukuta, 931 E. Capitol Blvd., Salt Lake City, Utah 84103, and Dragan Milosevic, Milentija Popovi a 11, 11070 N. Belgrade, Yugoslavia

Filed Jul. 18, 1983, Ser. No. 514,441
Int. Cl.[4] A01G *15/00*
U.S. Cl. 239—14 1 Claim



1. Apparatus for maintaining pressure on liquid propane in a cloud-seeding rocket holding chamber comprising:

A chamber for holding a first quantity of liquid propane;

Bag means disposed within said chamber for holding a second quantity of liquid propane;

Valve means actuated by a lever means and cord means for releasing said first quantity of liquid propane from said chamber to the atmosphere, and

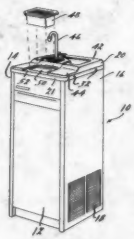
Ignition means for cutting said cord means to actuate said lever means.

4,600,148

DRAINLESS WATER COOLER

Doyle Raymer; Michael Eveland, both of Freeport, Ill., and Dennis J. Heyden, Browntown, Wis., assignors to King-Seeley Thermos Co., Prospect Heights, Ill.

Filed Oct. 17, 1983, Ser. No. 542,437
Int. Cl.[4] B05B *12/14*
U.S. Cl. 239—29.3 7 Claims



1. A drainless water fountain for connection to a pressurized source of potable water comprising:

a generally vertically arranged cabinet defining an internal compartment;

a top member disposed on said cabinet defining a first generally horizontal tier and a second generally horizontal tier above said first tier;

gooseneck means disposed on said second tier having discharge nozzle disposed substantially above said first tier;

a downwardly depending well integrally formed in said top member and disposed directly beneath said discharge nozzle; and

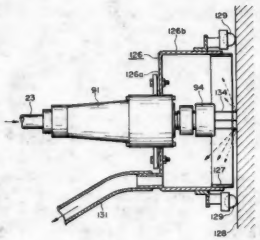
waste water receptacle comprising downwardly depending fluid containment pan having an imperforate bottom and nestably carried in said well, said pan having an outwardly flanged rim for resting on said top member, said rim having a top surface being substantially flush with the surface of said first tier and having an exposed flange portion substantially flush with the surface of said first tier and protruding forwardly of said cabinet to provide a means for grasping and removing said pan from said well.

4,600,149

APPARATUS FOR PRODUCING ULTRAHIGH PRESSURE WATER JET

Masakatsu Wakatsuki, Ota, Japan, assignor to Wakatsuki Kikai Kabushiki Kaisha, Gunma, Japan

Division of Ser. No. 542,810, Oct. 17, 1983, Pat. No. 4,534,711.
This application Feb. 13, 1985, Ser. No. 701,331
Claims priority, application Japan, Jul. 1, 1983, 58-103124[U]; Aug. 8, 1983, 58-123085[U]
Int. Cl.[4] B05B *1/28, 3/00, 1/34, 1/14*
U.S. Cl. 239—120 4 Claims



1. An ultrahigh pressure water apparatus for treating the surface of an object with high pressure jets of water, comrising an ultrahigh pressure pump, means for driving said pump, said pump being operative to receive feed water and discharge ultrahigh pressure water, and a nozzle gun for receiving the ultrahigh pressure water supplied from said ultrahigh pressure pump and for projecting said ultrahigh pressure water in the form of jets onto the surface of an object to be treated by such jets, said nozzle gun comprising:

a tubular nozzle cover;

a cylindrical shaft mounted for rotation within said nozzle cover, said cylindrical shaft having a retaining hole extending therethrough at a position which is eccentric to the center axis of said cylindrical shaft;

a metal tube retained in and extending through said retaining hole in said cylindrical shaft, said metal tube being rotatable relative to said shaft and having a high pressure through hole therein;

a high pressure hose connected at one end thereof to one end of said metal tube and extending therefrom out of said nozzle cover, the other end of said hose being connected to said ultrahigh pressure pump for transmitting said ultrahigh pressure water from said pump through said hose to said metal tube;

a nozzle retainer detachably attached to the other end of said metal tube coaxially therewith, said nozzle retainer having a filter receiving recess formed in a first end face thereof on the side of said retainer to be attached to said other end of said metal tube, said recess communicating with said high pressure through hole of said metal tube, a filter mounted in said filter receiving recess, a plurality of nozzle receiving holes formed in a second end face of said nozzle retainer opposite to said first end face, the interior of said nozzle retainer between said first and second end faces being formed to define a plurality of water paths located respectively between said filter receiving recess and said nozzle receiving holes, and a plurality of nozzles disposed respectively in said nozzle receiving holes for projecting ultrahigh pressure water jets from said nozzle gun;

a drive shaft rotatably mounted on said nozzle cover adjacent said cylindrical shaft;

means disposed in engagement with said drive shaft and said

cylindrical shaft for transmitting rotation of said drive shaft to the cylindrical shaft thereby to cause rotation of said metal tube and nozzle retainer;

a collector cover comprising a cylindrical tubular body mounted on said nozzle cover to surround and partially enclose said nozzle retainer, said tubular body having an opening at the end thereof which faces in the direction in which said ultrahigh pressure water jets are projected from said nozzle gun, the other end of said tubular body being closed by an end plate;

a plurality of casters mounted on said collector cover around the open end of said tubular body and extending forwardly of the said open end of said tubular body so that, when said nozzle gun is urged against the surface of an object to be treated, said casters engage said surface and maintain at a constant value the distance between said nozzles and the object surface while said nozzle gun is moved across the object surface; and

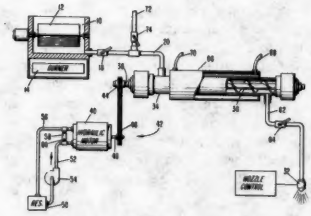
a vacuum pump and drain hose connected to said collector cover to reduce the ambient pressure within said collector cover, and to remove, through said drain hose, water which rebounds from said object surface to the interior of said collector cover.

4,600,150

SPRAYING SYSTEM UTILIZING A SCREW CONVEYOR

F. Joseph Zelasko, 2847 Hunter Rd., Fairfax, Va. 22031

Filed Apr. 22, 1980, Ser. No. 142,834
Int. Cl.[4] B05B *9/03*
U.S. Cl. 239—126 **6 Claims**



1. Apparatus for providing an instantaneous and continuous spray of a fluent material at a predetermined pressure, comprising:

a container for storing fluent material;

a substantially cylindrical casing having an input end in fluid communication with said container and an output end;

an output conduit connected to said output end of said casing;

a nozzle at the end of said conduit remote from said casing, one of said nozzle and said output conduit including control means for providing selective interruption of fluent material flowing through said conduit and out said nozzle;

a screw conveyor disposed within said casing; and

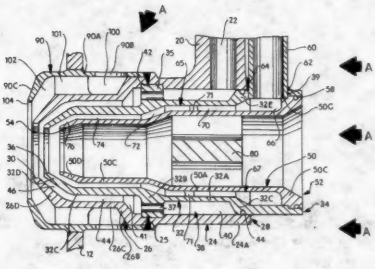
means for rotating said screw conveyor to displace fluent material in said casing from the input end toward the output end and for maintaining a predetermined torque on said screw conveyor to thereby maintain a predetermined pressure on the fluent material at said control means at all times regardless of whether fluent material is flowing out of said nozzle.

4,600,151

FUEL INJECTOR ASSEMBLY WITH WATER OR AUXILIARY FUEL CAPABILITY

Jerome R. Bradley, Sterling Heights, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 23, 1982, Ser. No. 444,015
Int. Cl.[4] B05B *7/10*
U.S. Cl. 239—400 **5 Claims**



1. An air-blast fuel injector assembly useful in the compressor discharge airstream of a gas turbine power plant comprising:

(a) a first sleeve means having a first longitudinal bore therethrough and having an open downstream end with a first annular lip and an upstream end;

(b) a second sleeve means disposed inside said first sleeve means, said second sleeve means having a second longitudinal bore therethrough and having an open downstream end with a second annular lip disposed upstream from said first annular lip and an upstream end, portions of said second sleeve means being spaced from said first sleeve means to form an annular liquid fuel-receiving chamber therebetween extending toward said first and second lips where the chamber opens for discharging liquid fuel over said first lip to form a fuel spray cone;

(c) a third sleeve means disposed inside said second sleeve means, said third sleeve means having a third longitudinal bore therethrough and having an open downstream end with a third annular lip disposed upstream from said second lip and an open upstream end, portions of said third sleeve means being spaced from said second sleeve means to form an annular water or auxiliary fuel-receiving chamber therebetween disposed inside relative to said liquid fuel-receiving chamber and extending toward said second and third lips where said chamber opens for discharging water or auxiliary fuel over said second lip in addition or alternatively to said liquid fuel, said third sleeve means receiving compressor discharge air through its open upstream end for discharge over said third lip to intermix with the fuel spray cone and/or water or auxiliary fuel from the inside, and

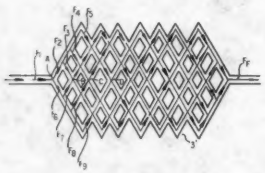
(d) an annular shroud means disposed exteriorly of said first sleeve means, said shroud means having a longitudinal bore therethrough and having an open downstream end with an annular shroud lip disposed downstream from said first lip and an upstream end into which said first sleeve means extends, portions of said shroud means being spaced from said first sleeve means to form an annular air-receiving chamber disposed exteriorly around said first sleeve means and extending downstream toward said shroud lip where said air-receiving chamber opens for discharging air over said shroud lip to intermix with the fuel spray cone and/or water or auxiliary fuel from the outside and other portions of said shroud means forming aperture means for receiving compressor discharge air.

4,600,152

MULTIPLE INTERSECTION DRIPPER

Samuel Samuelli, 32 Beech St., N. Arlington, N.J. 07032

Filed Jun. 6, 1983, Ser. No. 501,621
Int. Cl.[4] A01G *25/00*
U.S. Cl. 239—542 10 Claims



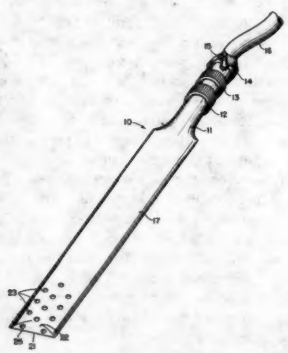
1. A water irrigation dripper including a pressure-dropping labyrinth for the water flowing from an inlet to an outlet of the dripper, said labyrinth including at least one section defining a main flowpath for the water, said main flowpath being divided into a plurality of at least two branches, each of said branches being divided into a plurality of sub-branches oriented such that the water flowing through each of the sub-branches of one branch intersects the water flowing through each sub-branch of the other branch at at least one intersection point, thereby to dissipate energy of said water before the water leaves the respective section and returns to the main flowpath.

4,600,153

CLEANING TOOL

Ronald K. Stone, 61 Gocke Pl., St. Louis, Mo. 63114

Filed May 11, 1984, Ser. No. 609,143
Int. Cl.[4] F28G *1/16*
U.S. Cl. 239—543 10 Claims



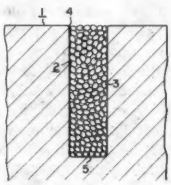
1. In combination with a refrigeration condenser to be cleaned, a cleaning tool comprising an elongated tubular tool body member having an open end adapted for connection to a pressurized source of cleaning fluid and having a remote closed end, said tool body having a flattened and relatively thin body portion throughout a major portion of its length extending to said closed end thereby forming a constricted hollow interior passage, and a plurality of jet ports formed in said flattened body portion adjacent to said remote closed end including at least two laterally spaced columns of multiple jet openings for producing a predetermined fluidic discharge pattern with convergence of the discharge jet streams for optimum cleansing of the refrigeration condenser.

4,600,154

STATIC EXPANSIVE DEMOLITION AGENT IN THE THREE-DIMENSIONAL FORM AND PROCESS FOR DEMOLISHING BRITTLE MATERIAL USING THE SAME

Takao Hirota, Ibaraki, and Yoichi Ishizaki, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,643
Claims priority, application Japan, Jul. 4, 1983, 58-120402
Int. Cl.[4] B02C *19/00*; C09K *3/00, 3/18*
U.S. Cl. 241—1 6 Claims



1. A static expansive demolition agent in the three-dimensional form obtained by compression-molding a powdery composition consisting essentially of calcium oxide as the expansive component, an aluminous cement and an alkali or alkaline earth metal salt of boric acid wherein the calcium oxide content is 40 to 90% by weight based on the total weight of the calcium oxide and the aluminous cement, the aluminous cement content is 10 to 60% by weight based on the total weight of the calcium oxide and aluminous cement, and the content of the alkali or alkaline earth metal salt of boric acid is 1 to 20 parts by weight per 100 parts by weight of the total of the calcium oxide and the aluminous cement.

6. A process for the static demolition of brittle materials, which comprises drilling holes in a brittle material, filling the holes with a static expansive demolition agent in the three-dimensional form obtained by compression-molding a powdery composition consisting essentially of calcium oxide as the expansive component, an aluminous cement and an alkali or alkaline earth metal salt of boric acid, and thereafter pouring water into the holes, wherein the calcium oxide content is 40 to 90% by weight based the total weight of the calcium oxide and the aluminous cement, the aluminous cement content is 10 to 60% by weight based on the total weight of the calcium oxide the aluminous cement, and the content of the alkali or alkaline earth metal salt of boric acid is 1 to 20 parts by weight per 100 parts by weight of the total of the calcium oxide and the aluminous cement.

4,600,155

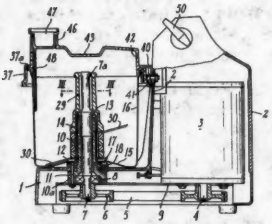
MACHINE FOR PROCESSING FOODSTUFFS AND OTHER PRODUCTS, PARTICULARLY FOR CHOPPING AND MIXING THE SAME

Pierre H. Bos; Joël R. Musseau, and Jean-Pierre Richard, all of Aubusson, France, assignors to Dito Sama, Aubusson, France

Continuation of Ser. No. 427,933, Sep. 29, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,565
Claims priority, application France, Oct. 2, 1981, 81 18607
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—37.5 13 Claims

1. A processing machine for chopping and mixing foodstuffs and other products, said processing machine comprising a casing, a base extending laterally from said casing, a driving motor assembly disposed in said casing, a driven shaft driven by said motor assembly and extending vertically through said base, a substantially cylindrical open-top tank having a bottom wall and a tubular member extending upwardly in the interior of said tank such that said driven shaft is disposed within said tubular member when said tank is placed on said base with an upper portion of said driven shaft projecting from said tubular

member, a sleeve disposed around said tubular member, coupling means between said sleeve and said projecting portion of said driven shaft for driving said sleeve by said driven shaft, cutters attached to said sleeve, a finger projecting from the bottom of said tank, a stop member in the form of a socket disposed in said base for engagement by said finger for providing a predetermined position of the tank relative to said base, a removable cover disposed over said tank for closing said tank,



a locking ring interconnecting said cover and said tank, said locking means being arranged to provide said cover with limited freedom for rotating relative to said tank, abutment means associated with said casing and co-operating with said locking means for preventing separation of said tank from said base when said tank is in an operative position, and a position detector associated with said abutment means for preventing activation of the motor assembly unless said cover and said tank are in an operative position.

4,600,156

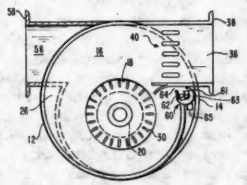
CARBON BLACK MILL

Robert W. Duyckinck, 187 Commonwealth Ave., New Providence, N.J. 07974

Filed Mar. 13, 1984, Ser. No. 589,130

Int. Cl.⁴ B02C *13/282*

U.S. Cl. 241—56 **6 Claims**



1. Apparatus for effecting a selective diminution of the size of oversized particulate material constituting a minor fraction of a quantity of finely divided particulates entrained in a moving gas stream comprising

a rotor having a plurality of hammer members extending from the periphery thereof and disposed parallel to the rotor axis, each including a radially disposed and generally rectangular planar impact surface positioned parallel to the rotor axis and adapted to be displaced at a first predetermined velocity through a path of advance definitive of a locus of particle impact and comminution,

a volute-shaped entry chamber disposed in surrounding relation to said rotor and to said locus of particle impact for selectively directing said gas stream and particulates entrained therein in an inwardly directed spiral flow pattern substantially coplanar with and tangentially into the path of advance of the impact surfaces of said hammer members,

a volute shaped exit chamber disposed adjacent to and downstream of said locus of particle impact and in fluid communication therewith for reception and delivery of said gas stream and particulate material entrained therein after passage thereof through the locus of particle impact,

means, including fan means disposed in said volute shaped exit chamber, for inducing the flow of said gas stream and particulate material entrained therein through said volute shaped chambers and through said locus of particle impact and comminution at a second predetermined velocity having a magnitude no greater than one-half that of said first predetermined velocity.

4,600,157

BOWL MILL

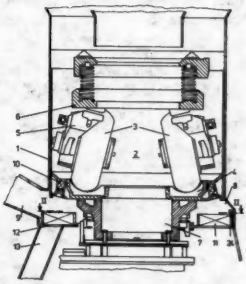
Rudolf Willach, Oberhausen, and Günter Dibowski, Essen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 31, 1984, Ser. No. 666,914

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344223

Int. Cl.⁴ B02C *15/04*

U.S. Cl. 241—59 **20 Claims**



1. A bowl mill with a vertically powered milling bowl having milling cylinders rolling over inside a milling space surrounded by a housing; an annular air box communicating with said milling space below the milling bowl; outlet aperture means in the floor of said air box and evacuator means extending through said air box; said evacuator having separate drive means independent of means for driving the mill; said evacuator means comprising ring means with scraper means; and catch means engaging said scraper means.

4,600,158

RUNNER CHOPPER

Hideyasu Matoba, Osaka, Japan, assignor to Matex Co., Ltd., Osaka, Japan

Filed Jun. 16, 1982, Ser. No. 388,819

Claims priority, application Japan, Jun. 30, 1981, 56-101725

Int. Cl.⁴ B02C *18/06*

U.S. Cl. 241—243 **10 Claims**

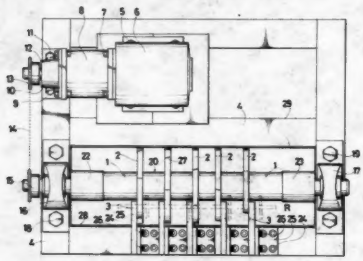
1. A motor-driven rotary chopper aparatus for cutting plastic runners, comprising:

a plurality of rotary blades n in number mounted on a rotating driven shaft and separated axially on said driven shaft, wherein said driven shaft rotates slowly so that the apparatus runs quietly;

cutting means m in number on each of said rotary blades, each cutting means having a centripetal cutting well wherein a positioning phase angle of separation of each of said cutting means around said driven shaft is in accordance with the formula $360°/(m)\times(n)$ so that only one of said cutting means cuts one runner at a time; and,

a plurality of separated fixed blades positioned adjacent to said rotary blades to provide a plurality of cutting areas

with said centripetal cutting wells of said rotary blades thereby forcing an object sandwiched between said rotary blades and said fixed blades into said cutting wells, said separated rotary blades and said separated fixed blades



interacting together at interaction cutting areas and providing a plurality of axial non-cutting gaps between the interaction cutting areas so that a runner that has been cut between adjacent rotary blades will fall into the non-cutting gap between the adjacent rotary blades.

4,600,159

PROCESS AND MACHINE FOR DISINTEGRATING MATERIALS

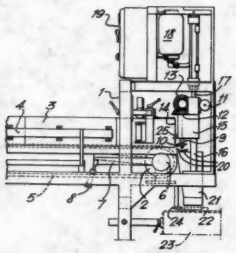
Yngve R. Akesson, Helsingborg, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 486,866, Apr. 20, 1983, abandoned. This application Jul. 26, 1985, Ser. No. 759,514

Claims priority, application European Pat. Off., Apr. 21, 1982, 82103369

Int. Cl.[4] B02C *18/26*

U.S. Cl. 241—280 **11 Claims**



1. A machine for disintegrating a soft food material, said machine comprising:

(a) a disintegrating element incorporating at least one rotary cutter, said at least one rotary cutter having an axis of rotation, an elongated arm extending transversely with respect to said axis of rotation, and a fin-like blade having two oppositely-facing major surfaces, said blade projecting from said arm and being remote from said axis of rotation, said major surfaces of said blade being generally parallel to said axis of rotation, one of said major surfaces facing said axis of rotation, said blade having a first cutting edge that extends generally parallel to said axis of rotation;

(b) means for reciprocating said disintegrating element so that the cutter moves along a path in a predetermined plane of reciprocation;

(c) means for rotating said cutter about said axis of rotation so that said blade orbits about said axis of rotation, said axis of rotation being disposed parallel to said plane of reciprocation; and

(d) means for positioning a mass of said soft food material so that a surface of said mass is disposed substantially parallel to both said plane of reciprocation and said axis of rotation, and so that said blade intermittently engages said surface of said mass and shaves shreds of material from said mass as the blade orbits about said axis of rotation and sweeps across said surface while the disintegrating reciprocates.

4,600,160

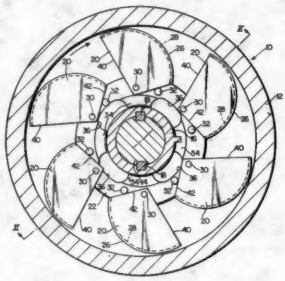
CHOPPER BLADE ASSEMBLY

Ronald E. Mengel, Madison, and Thomas E. Seipel, Sun Prairie, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Sep. 20, 1984, Ser. No. 652,687

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—282.2 **7 Claims**



1. In a continuous chopper assembly including a housing having received therein a rotatable shaft, a plurality of blade members, means for mounting said blade members on said shaft for rotation therewith, inlet means in said housing for the delivery of material thereinto for comminution by said blade members, and drive means for rotating said shaft, the improvement, wherein each said blade members has three major sides comprising a substantially accurate curved cutting edge, an abutment edge and further edge intersecting said abutment edge, said abutment edge being shorter than said further edge, wherein said mounting means for each blade member includes a pivot member for providing of the corresponding blade member about a pivot axis remote from said curved cutting edge and being located in proximity to the intersection between the abutment edge and the further edge during the rotation of said shaft and wherein said assembly further includes a stop member for each blade member mounted on said mounting means downstream of the corresponding pivot member in the direction of rotation of the blade members and positioned in the path of travel of the abutment edge of the corresponding blade member such that said corresponding blade member engages said stop member, during rotation of said drive shaft.

4,600,161

METHOD AND APPARATUS FOR STORING ELECTRICAL CONTACT STRIPS

Joseph V. Barboza, South Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

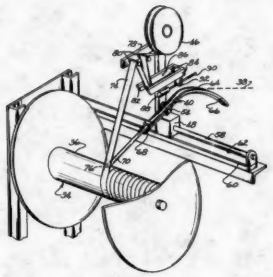
Filed Jan. 4, 1984, Ser. No. 568,158

Int. Cl.[4] B65H *18/08, 54/28*

U.S. Cl. 242—55 **12 Claims**

11. Apparatus for winding a continuous contact element carrier strip having a selected width on a reel having a core portion with a length a plurality of times greater than the width of the strip comprising a reel support adapted to rotatably support a reel, a traverse mechanism mounted adjacent to

the reel support adapted to move back and forth along the length of the reel, the traverse mounting thereon guide means, the guide means adapted to direct the carrier strip onto the core of the reel, the guide means including a carrier strip receiving tube, the tube being elliptical in shape having a horizontal major axis and vertical minor axis, the width of the



carrier strip with depending conductive contact elements being greater than the minor axis and less than the major axis to ensure that the carrier strip is properly oriented as it is received on the reel and means to rotate the reel and move the traverse mechanism back and forth along the length of the reel in synchronization.

4,600,162

PAPER TOWEL INSERT AND DISPENSER

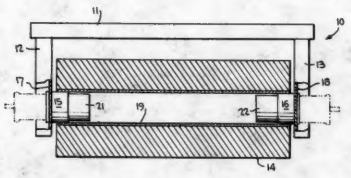
Jerry Hidle, Panama City, Fla., assignor to Panhandle Industries, Inc., Panama City, Fla.

Continuation-in-part of Ser. No. 596,352, Apr. 3, 1984, Pat. No. 4,535,947. This application Mar. 15, 1985, Ser. No. 712,224

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] B65H *16/06, 19/10*

U.S. Cl. 242—55.2 **12 Claims**



1. A paper roll dispenser, comprising:

a central body portion;

first and second support arms respectively extending from opposite end portions of said central body portion for supporting a paper roll therebetween;

first and second support cylinders provided on respective end portions of said support arms for insertion within the paper roll for supporting the roll thereon, said support cylinders each having a predetermined length and extending inwardly toward each other from inner surfaces of said end portions;

a cylindrical support plug axially received within at least one said support cylinder for axial movement relative thereto and having a length substantially greater than said predetermined length of said one support cylinder, grasp means on said support plug for axially moving said plug within said one support cylinder between an inwardly projected position and an outwardly extended position, a first annular rib on said support plug extending radially outwardly from the outer surface thereof capable of bearing engagement with said one support cylinder for limiting movement of said plug in said outwardly extended position thereof, and a second annular rib on said support plug extending radially outwardly from said outer surface thereof capable of bearing engagement with said one suppoort cylinder for limiting movement of said plug in said inwardly projected position thereof, said ribs being spaced apart a distance greater than said predetermined length of said one support cylinder, whereby said support plug in said inwardly projected position thereof extends a greater distance within the paper roll compared to that of said one support cylinder for further supporting the roll and for preventing unintended removal of the paper roll from the dispenser.

4,600,163

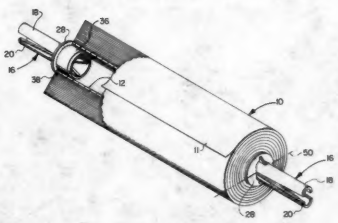
APPARATUS FOR CONTROLLED MANUAL UNROLLING OF ROLLED FLEXIBLE MATERIAL

John E. Hummel, and William E. Baab, both of Tulsa, Okla., assignors to Linear Films, Inc., Tulsa, Okla.

Filed Dec. 10, 1982, Ser. No. 448,614

Int. Cl.[4] B65H *23/06;* **B25B** *33/00*

U.S. Cl. 242—96 **13 Claims**



9. Apparatus for controlled manual unrolling of a length of flexible material wound on a tubular core defining an open ended cylindrical bore, said apparatus comprising:

a pair of spaced apart, elongated hand grip means disposed in generally parallel relationship to a longitudinal axis, and sized and spaced to be grasped by a single operator's hand and moved together;

a pair of spaced apart brake shoe means sized to be received in the open ended cylindrical bore and to exert a variable sliding braking force on the interior surface of the cylindrical bore when forced apart and spaced from the hand grip means; and

mechanical means interconnecting the hand grip means and the brake shoe means for forcing the brake shoe means apart to exert a variable sliding braking force on the core in response to a manually applied force on the hand grip means whereby an operator can both hold the core and roll of material thereon and control the tension of the flexible material as it is unwound from the core.

4,600,164

SAFETY SEAT BELT SYSTEM AND LATCH RELEASE MECHANISM USED THEREIN

Henry Ty, Attleboro, Mass., and Alfred J. White, North Providence, R.I., assignors to Texas Instruments Incorporated, Attleboro, Mass.

Division of Ser. No. 395,533, Jul. 6, 1982, Pat. No. 4,537,365, which is a continuation-in-part of Ser. No. 333,234, Dec. 21, 1981, abandoned. This application Apr. 22, 1985, Ser. No. 710,338

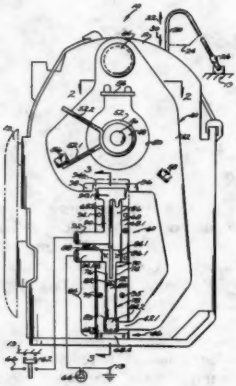
The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.[4] B60R *22/34*

U.S. Cl. 242—107.6 **1 Claim**

1. An electrically operable control device comprising a support of an electrically insulating material, a first thermostat

metal strip, a second thermostat metal strip cooperating with the first strip to form thermostat metal control means, the thermostat metal control means having one end secured to the support and having a control portion at its opposite end movable between control positions, and means for directing electrical current through at least a selected portion of the thermostat metal control means including at least a part of said first strip for self-heating the thermostat metal control means, the first and second strips being formed of material having corresponding thermal response characteristics for maintaining said control portion in one of said control positions during changes in ambient temperature, the first strip being formed of material having relatively greater electrical resistivity than the second strip to be more rapidly self-heated to move the control portion to a second control position to perform a control function when electrical current directed through said selected portion of the thermostat metal control means is directed through at least a part of said first strip, characterized in that, the support comprises an electrically insulating member having a surface extending in a selected plane and having means for mounting the member on a mechanism to dispose the selected support member plane in a selected orientation relative to a plane of said mechanism, the first thermostat metal strip extends in one direction and has an end thereof welded to an end of the second thermostat metal strip so the second strip extends in said



one direction away from the first strip and so that the thermostat metal control means comprises a welded reverse bimetal, the first and second strips each embody metal layers bonded together and the strips have selected lengths, widths and thicknesses providing the reverse bimetal with a preferred direction of flexing perpendicular to the metal layers in response temperature change and with a maximum resistance to bending in response to applied force in a direction transverse to the widths of the strips, and means securing one end of the reverse bimetal to the support member so the reverse bimetal extends over said selected support member plane with said metal layers parallel to that plane to dispose an opposite control portion end of the reverse bimetal over the support plane to move perpendicular relative to that support plane in moving between said control positions, whereby the support is adapted to be mounted on said mechanism having a latch biased to move in a selected direction in said mechanism plane so that the support member plane extends parallel and closely adjacent the mechanism plane, the control portion of the reverse bimetal when in said first control position is arranged with its direction of maximum resistance to bending disposed in the mechanism plane along the direction of latch movement for normally preventing latch movement, and the control portion of the reverse bimetal is readily flexed out of the mechanism plane to permit latch movement in that plane when the control portion moves to its second control position.

4,600,165

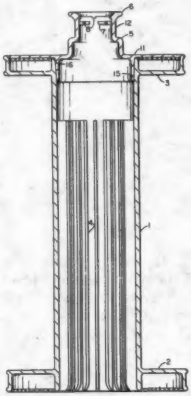
TEXTILE BOBBIN

John B. Shoemaker, Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 21, 1983, Ser. No. 553,610

Int. Cl.[4] B65H *75/14*

U.S. Cl. 242—118.4 **6 Claims**



1. A textile bobbin comprising a hollow, cylindrical, elongated tube, spaced apart top and bottom circular flanges on said tube, the bottom flange having a flat solid surface facing the bobbin tube surface, and a solid circular side wall, the flat surface and the side wall of the bottom flange being reinforced with radial and vertical ribs attached thereto, said top flange having a flat solid bottom surface facing the tube and a solid circular side wall which, with the bobbin tube forms a circular recess in said top flange, said circular side wall and flat solid surface being reinforced in said recess with radial and vertical ribs attached to their respective surfaces, the tube surface between the flat solid surfaces of said flanges defining the wind area for yarn placed on the bobbin, longitudinal ribs on the interior of said hollow elongated tube, spaced equidistant from each other and running parallel to the long axis of the bobbin tube from a point on the inside of the tube below the bottom of the top flange to the base of the tube and defining an opening suitable for engagement of the ribs with a spindle, said ribs being curved downwardly and inwardly toward the inner tube wall to define an upwardly sloping opening larger in diameter than the inner core formed by the longitudinal ribs, a cover member for the top flange having a flat solid surface coextensive with the area of the top flange and adapted to cover the recess in said top flange and engage the radial ribs thereof, the bobbin tube and circular side wall of said top flange to thereby completely enclose said recess, a circular, hollow, inwardly tapered plug depending downwardly from the cover member and integrally molded therewith and adapted to engage the bobbin tube at the top thereof, said bobbin tube having an outwardly tapered upper section on the interior thereof adapted to receive said plug, a shoulder, neck and collar on said cover member and extending vertically and integrally molded therewith to thereby form the bobbin top, said bobbin tube having an outside diameter between 60 millimeters and 70 millimeters and the flanges at the top and bottom having a width between the outer surface of said bobbin tube and the outside edge of each of said flange of at least 32 millimeters.

4,600,166

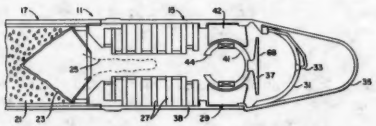
MISSILE HAVING REDUCED MASS GUIDANCE SYSTEM

Herbert T. Califano, Bloomingdale; James M. Schuchardt, Ramsey, and Gotthard K. Spindler, Hasbrook Heights, all of N.J., assignors to Allied Corporation, Morris Township, N.J.

Filed Jun. 11, 1984, Ser. No. 619,657

Int. Cl.[4] F41G *7/00*; F42B *13/10*

U.S. Cl. 244—3.16 **19 Claims**



1. Guided missile having a warhead with a shaped charge which expels energy in a forward direction, a guidance system including a gyroscope located forward of the shaped charge, and the gyroscope having a rotor which has an axis extending from a front end to an aft end of the rotor, a stator which remains stationary with respect to the rotor, means for causing the rotor to rotate about said axis and means to determine the angular position of said axis, characterized by:

(a) the rotor having an outer surface which has a shape of a sphere section and the rotor being substantially hollow; and

(b) the stator having an inner surface which has a shape of a sphere section and juxtaposed with said outer surface.

4,600,167

PIVOTING GUIDANCE MECHANISM FOR SMALL-CALIBERED PROJECTILES

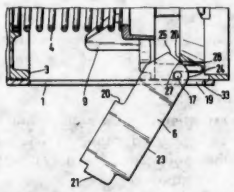
Manfred Kastenhuber, Rednitzhembach; Alfred Eckel, Ireuchtlingen, and Erich Bock, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,302

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1983, 3328520

Int. Cl.[4] F42B *13/32*

U.S. Cl. 244—3.28 **6 Claims**



1. A pivoting guidance mechanism for small-calibered projectiles, missiles or small bombs, including a housing having elongated slots; axially oriented and form-fitted fins being fastened within said housing, said fins having free ends and retained ends being pivotable transverse to the longitudinal axis of said housing and being guided in said elongated slots; a centrally located prestressed coil spring in said housing; and a slider actuatable through said coil spring for extending said fins outwardly; the improvement comprising in that said fins radially extend substantially in parallel with said coil spring within said housing in their retracted inoperative position, the free ends of said fins being located in approximately the same plane as the end of the coil spring which contacts a fixed support in said housing; means imparting an axial stroke to said slider for unlatching said fins from their retracted position, said fins at said retained ends being rotatably fixed on the slider, support surface means extending transverse to the longitudinal axis of the projectile for pivoting said fins radially outwardly opposite the direction of flight; an axially movable bearing ring within said housing forming, in conjunction with the retained ends of said fins engaging said support surface means and said slider, a camming arrangement for latching said fins in their radially outwardly extended position.

4,600,168

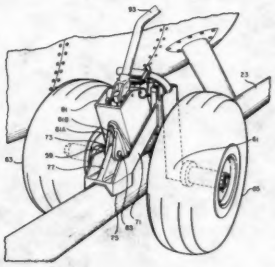
GROUND HANDLING APPARATUS FOR A HELICOPTER

Charles E. Selecman, Fort Worth, Tex., assignor to Spinks Industries, Inc., Fort Worth, Tex.

Filed Jan. 6, 1984, Ser. No. 568,885

Int. Cl.[4] B64C *25/34*

U.S. Cl. 244—50 **8 Claims**



5. An apparatus for attachment to a skid type landing rail of a helicopter for use for moving the helicopter while on the ground, comprising:

an attaching means adapted to be attached to said rail such that when said attaching means is lifted, it lifts said rail,

support means pivotally coupled to said attaching means,

structure connected to said support means and having an engaging means located at a position spaced from said support means and from said attaching means,

said engaging means being adapted to engage the top portion of said rail when said attaching means is attached to said rail,

frame means having a central portion and two spaced apart arms extending from said central portion,

said frame means having its central portion pivotally coupled to said support means,

wheels attached to the lower ends of said arms such that said wheels may be located on opposite sides of said rail when said attaching means is attached to said rail,

lever means attached to said central portion of said frame means,

cylinder and piston means coupled between said structure and said lever means,

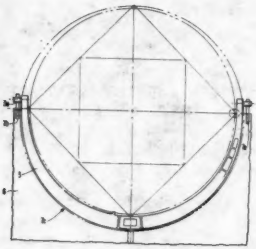
said arms of said frame means being adapted to be moved by said cylinder and piston means between a first position where said wheels allow said rail to engage the ground and a second position where said wheels lift and support said attaching means and hence said rail above the ground, wherein said pivotal coupling of said support means to said attaching means permits relative movement between said support means and said rail when said attaching means is attached to said rail and when said arms and said frame means are moved to said second position.

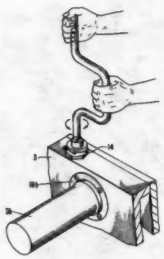
4,600,169

INTEGRATED SPACECRAFT CRADLE AND SHUTTLE STRUCTURE

William G. Koster, Tustin, and Allan B. Byrne, Agoura, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1983, Ser. No. 564,964
Int. Cl.[4] B64C *1/20*; B64G *1/22*
U.S. Cl. 244—118.1 **7 Claims**





1. An arrangement for supporting a space vehicle in a launch vehicle, comprising:

a carrier for receiving and supporting said space vehicle;

a plurality of attachment members on said carrier for engaging said launch vehicle;

means movably mounting at least one attachment member on said carrier to provide a component of movement along a path toward and away from said launch vehicle to provide adjustment so that all of said attachment members engage said launch vehicle;

a mechanical drive mechanism having at least one rotatable drive member including a threaded portion engaging said at least one attachment member to move said at least one attachment member; and

means for substantially preventing movement of said at least one attachment member by substantially preventing rotation of said rotatable drive member when at least one attachment member engages said launch vehicle.

4,600,170

TANDEM SEAT FOR ULTRA LIGHT AIRCRAFT

Terry L. Smith, 18030 Balfern Ave., Bellflower, Calif. 90706

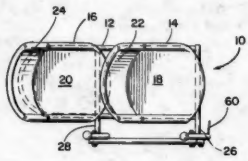
Continuation-in-part of Ser. No. 401,073, Jul. 23, 1982, abandoned. This application Oct. 17, 1983, Ser. No. 542,403
Int. Cl.[4] B64D *11/06*
U.S. Cl. 244—122 R **7 Claims**

5. A method for converting a single seat ultralight aircraft into a tandem seat ultralight aircraft comprising:

removing said single seat from said ultralight aircraft frame;

providing a tandem seat assembly frame to fit on the frame of said ultralight aircraft;

fastening a first bucket seat and a second bucket seat to said tandem seat assembly frame, said second bucket seat being placed behind and in close proximity to said first bucket seat;



providing dual control means attached to said tandem seat assembly; and

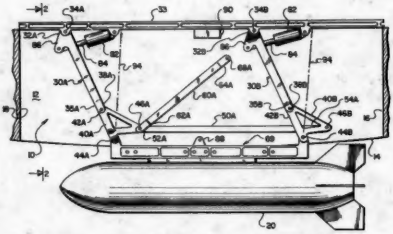
attaching said tandem seat assembly to said ultralight aircraft frame.

4,600,171

AIRCRAFT STORES VERTICAL EXTENSION AND RETRACTION SYSTEM

John B. Kalisz, Newhall, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Oct. 12, 1984, Ser. No. 660,174
Int. Cl.[4] B64D *1/08, 9/00*
U.S. Cl. 244—137 A **4 Claims**



1. An aircraft stores extension and retraction system for raising and lowering stores mounted to a stores supporting assembly along a substantially vertical path of a specified length comprising:

first and second translating links each having first, second, and third pivot supports forming the corners of a right triangle, the stores supporting assembly coupled to each of said second pivot supports;

at least one connecting rod pivotally attached at its first and second ends to said third pivot supports of the first and second translating links, respectively;

first and second positioning links having first and second ends; said first ends of said positioning links being pivotally attached to the structure of the aircraft and said second ends of said positioning links being pivotally attached to said first pivot supports of said first and second translating links, respectively; and

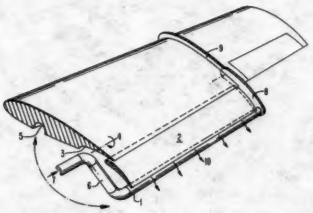
at least one control link having first and second ends, said first end pivotally attached to the structure of the aircraft and said second end pivotally attached to said third pivot support of said first translating link;

such that as said positioning links pivot about their first ends, said second pivot supports translate substantially along a vertical path.

4,600,172
RETRACTABLE ROUNDED TRAILING EDGE FOR CIRCULATION CONTROL WING

John L. Loth, P.O. Box 4094, Morgantown, W. Va. 26505

Filed Jan. 9, 1984, Ser. No. 569,575
Int. Cl.[4] B64C *21/08, 21/04*
U.S. Cl. 244—207 7 Claims



1. A high-lift circulation control wing having a sliding, retractable flap, movable from a recessed position to an extended position, said high-lift circulation control wing comprising:

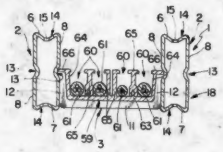
a rounded trailing edge positionable along the outer longitudinal edge of said retractable flap when said retractable flap is in its extended position, said rounded trailing edge being formed by a cylindrical air supply duct which conducts compressed air injected from the fuselage, said air supply duct including slots from which the compressed air is ejected in a direction tangential to the surface of the air supply duct when said rounded trailing edge is positioned along the outer longitudinal edge of said retractable flap to thereby increase lift; and

positioning means coupled to said rounded trailing edge for selectively positioning said rounded trailing edge independently of said retractable flap, said positioning means extending said rounded trailing edge to a position along the outer longitudinal edge of said retractable flap independent of the retractable flap to increase lift and retracting said rounded trailing edge to a storage position to enable said circulation control wing and said retractable flap to function as a conventional airfoil.

4,600,173
LOAD-BEARING BAR FOR OFFICE FURNITURE

Francesco Frascaroli, Bologna, and Carlo Biondi, S. Giovanni in Persiceto, both of Italy, assignors to C.O.M. Cooperativa Operai Metallurgici S.C.R.L., Bologna, Italy

Filed Apr. 18, 1984, Ser. No. 601,853
Claims priority, application Italy, Apr. 22, 1983, 4849/83[U]
Int. Cl.[4] F16L *3/22*
U.S. Cl. 248—68.1 3 Claims



1. A load bearing bar for office furniture, said bar having a modular structure and comprising:

(a) a plurality of bar segments having a substantially U-shaped cross-section, each bar segment comprising:

(i) two laterally spaced parallel tubular beams of substantially rectangular cross-section with a pair of opposed upper and lower walls and a pair of opposed inside and outside walls, each wall defining a longitudinal central groove, the upper and lower walls defining a pair of aligned substantially rectangular slots through the grooves near each end of each beam, the rectangular slots longitudinal axes being parallel to the beam longitudinal axis;

(ii) at least one generally U-shaped intermediate base element interposed between the parallel rectangular beams, the base element having upturned side portions connected to the respective inside walls of the beams, thereby connecting the beams to each other;

(iii) a wiring channel supported by the base element and having a pair of laterally spaced upstanding resilient side walls terminating in transverse tabs extending laterally outwardly from the side walls to be resiliently received in the grooves of the beams inside walls; and

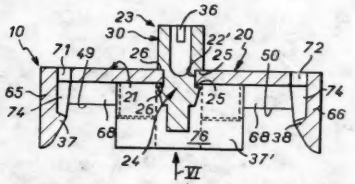
(b) a pair of connecting elements for rigidly connecting longitudinally aligned bar segments to each other, each connecting element having a center portion interposed between aligned ends of a pair of bar segment beams, each connecting element having coaxial tabs oppositely extending from the center portion and being received within the aligned ends of the pair of beams, each tab having a generally rectangular transverse slot therethrough aligned with the slots in the beam upper and lower walls when the tab is inserted into the beam end; and

(c) a pair of pins associated with each connecting element, each pin having a generally rectangular shank being inserted through a slot in the beam upper wall and through an aligned slot in the connecting element tab, the pin having a head larger than the beam slot for resting on the beam upper wall.

4,600,174
DUCT MOUNTING FIXTURE FOR SECURING A DUCT ON A SUPPORT

Marc Gosse, and Jacques Chéron, both of Cleres, France, assignors to Legrand, Limoges, France

Filed Dec. 27, 1983, Ser. No. 565,763
Claims priority, application France, Sep. 16, 1983, 83 14758
Int. Cl.[4] A44B *21/00*
U.S. Cl. 248—72 15 Claims



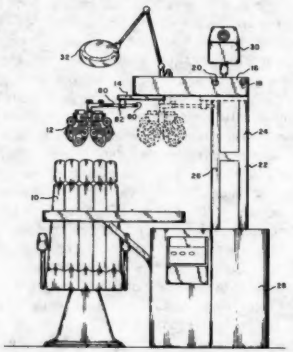
1. A duct mounting fixture for securing a duct selected generally channel-shaped support sections having right angle flanges at distal ends of legs or sidewalls, said duct mounting fixture comprising a base plate having an outer surface defining a bearing surface for an endwall of a duct, means for receiving a fastening member in a middle zone of the outer surface of the base plate, said fastening member in a middle zone of the outer surface of the base plate, said fastening member being adapted to extend through an opening in the endwall of the duct and grip the endwall, two pairs of retaining teeth being disposed on the underside of said base plate and each of said pairs of retaining teeth being selectively cooperable with right angle flanges of a different support section, each of said retaining teeth being carried by a separate arm, one of said arms for each of said pairs of retaining teeth being resiliently deformable, one of said pairs of retaining teeth extending in a first direction and the other of said pairs of retaining teeth extending in a second direction at an angle to said first direction.

4,600,175

REFRACTING INSTRUMENT SUPPORT ARM

Charles D. Bell, Mickleton, N.J., and Pat Smith, Berwyn, Pa., assignors to Charles D. Bell Incorporated, Westville, N.J.

Filed Oct. 18, 1984, Ser. No. 662,267
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—122 **5 Claims**



1. A support for a refracting instrument comprising:
a substantially vertical support column;
a fixed and rigid elongated support member secured to said vertical column adjacent one end of said support member and extending substantially horizontally from said column, said support member including an elongated shaft of substantially circular cross section;
a slide assembly carried by said support member and being slideably mounted thereon, said slide assembly including a pair of spaced apart bearing blocks having substantially circular openings therein which allow said blocks to slide along said shaft with said shaft passing through said openings, said slide assembly being freely slideably movable between a first position adjacent said support column and a second position remote from said column and adjacent the free end of said support member;
means for preventing said slide assembly from rotational movement around the axis of said shaft, said preventing means including an elongated fixed track lying above and extending parallel to said shaft and a pair of wheels carried at the top of said bearing blocks which ride on said track;
means adjacent each end of said support member for maintaining said slide assembly in said first and second positions;
a rigid bar adjustably mounted on said slide assembly and being adapted to carry a refracting instrument thereon.

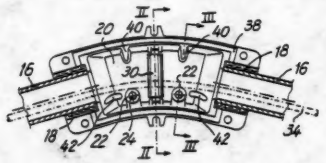
4,600,176

APPARATUS FOR PRODUCING A CABLE CONDUIT SYSTEM SUITABLE FOR THE DRAWING-IN OF CABLES

Hermann Ludwigs, Eupen, Belgium, assignor to Kabel- und Gummiwerke, Aktiengesellschaft abgekürzt; "Kabelwerk Eupen", Manufactures de Cables Electrique et de Caoutchouc, Société Anonyme, en abrégé and "Cablerie d'Eupen", Aktiengesellschaft, all of Eupen, Belgium

PCT No. PCT/BE84/00014, § 371 Date Jan. 23, 1985, § 102(e) Date Jan. 23, 1985, PCT Pub. No. WO84/04998, PCT Pub. Date Dec. 20, 1984
PCT Filed Jun. 8, 1984, Ser. No. 705,434
Claims priority, application Belgium, Jun. 10, 1983, 210979
Int. Cl.[4] F21C *29/16*
U.S. Cl. 254—134.3 FT **7 Claims**

1. An elbow for use in cable conduit systems to facilitate the pulling of cable through such conduits at a point where the conduit materially changes direction comprising,
a hollow curved body;
means for hermetically sealing said body at each end thereof to a cable conduit; and



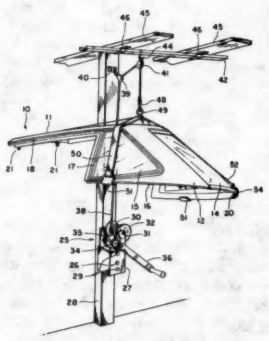
first roller means disposed completely within said hollow body in a first plane and second roller means spaced from said first roller means and disposed completely within said body in a second plane for guiding a cable therethrough.

4,600,177

METHOD OF HOISTING AN AUTOMOBILE HARD TOP

Albert E. Fritz, Los Gatos, Calif., assignor to Precision Auto Designs, Inc., Campbell, Calif.

Continuation of Ser. No. 599,639, Apr. 12, 1984, abandoned.
This application Sep. 27, 1985, Ser. No. 780,993
Int. Cl.[4] B66F *7/26*; B66D *1/36*
U.S. Cl. 254—338 **1 Claim**



1. The method of removing and replacing an automobile hard top on an automobile wherein the hard top comprises a horizontal top surface, a rear window portion and two side panel portions, said method comprising:
supplying a sling having a strap with hooks on each end and a second cable having a hook on each end;
hooking the strap hooks to the opposite side panels of the hard top so the hard top will lift up in the horizontal position from the automobile;
hooking the second cable to the rear window portion and the horizontal top surface;
supplying a lifting means to hoist the strap and second cable vertically to lift the hard top from the automobile; and
making the length of the second cable attached to the rear window portion so it is sufficiently short to lift the rear window portion first and tilt the hard top forward from the horizontal to properly separate the hard top from the automobile.

4,600,178

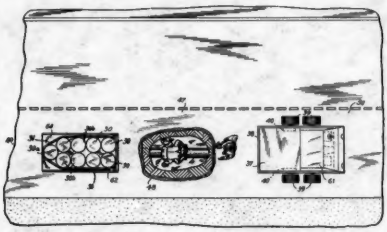
METHOD OF PROTECTING A ROADWAY MAINTENANCE AND CONSTRUCTION SITE

Stanley Zucker, 15 Mary Beth Dr., Suffern, N.Y. 10901, and Fritz Schwarting, 477 Beverly Rd., Ridgewood, N.J. 07450

Continuation-in-part of Ser. No. 452,151, Dec. 22, 1982, Pat. No. 4,552,341. This application Feb. 14, 1985, Ser. No. 701,697

Int. Cl.[4] E04H *17/00*

U.S. Cl. 256—1 9 Claims



1. A method of protecting a roadway maintenance or construction site, comprising, in combination:

releasably suspending a crash cushion beneath a vehicle;

moving said vehicle with the crash cushion suspended therefrom to the site;

positioning the vehicle such that the crash cushion will block oncoming traffic at said site;

depositing the crash cushion on the roadway at the site;

detaching said crash cushion from the vehicle while the cushion is on said roadway; and

removing the vehicle from the site.

4,600,179

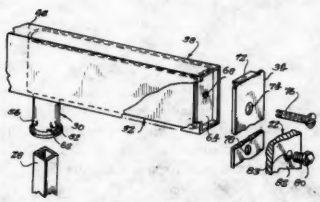
MODULE FOR FORMING A BARRIER AND METHOD OF ASSEMBLY

Charles A. Willetts, Wollaston, England, assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Apr. 16, 1985, Ser. No. 723,741

Int. Cl.[4] E04H *17/14*

U.S. Cl. 256—67 14 Claims



1. A module for use in forming a barrier and having first and second ends adapted for attachment to spaced supports, said module comprising:

a pair of aligned metallic tubular rails having facing inside walls and each having first and second end portions, each inside wall having a plurality of spaced apertures therealong with respective apertures in each inside wall corresponding to each other and forming pairs;

a bushing formed of resilient material lining each of said apertures;

a plurality of spaced metallic rungs extending between said rails with each rung having end portions received by a respective pair of apertures in said inside walls so that the rung end portions extend inside the respective tubular rails; and

a retainer received in each rail end portion and including an abutment wall portion in association with one of said rung end portions, an attachment wall portion lying adjacent the rail end so that said rung end portion is disposed between the abutment wall and the attachment wall, and means interconnecting said abutment and attachment wall portions.

4,600,180

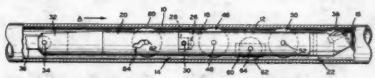
SCARFING TOOL

Nelson D. Abbey, III, Toledo, Ohio, assignor to Abbey Etna Machine Company, Perrysburg, Ohio

Filed Feb. 19, 1985, Ser. No. 703,031

Int. Cl.[4] B23K *7/04*

U.S. Cl. 266—51 7 Claims



1. An apparatus for removing an internal raised weld bead of a longitudinally seam welded tubular member, comprising:

a. an elongate support body having first and second ends longitudinally spaced in a cutting direction, said support body having a first surface facing the raised bead of the weld seam and an oppositely facing second surface with said surfaces extending longitudinally between the ends of said support body;

b. a cutting tool mounted at one end of said body and projecting outwardly from said first surface;

c. pivot means mounted in said body intermediate of said first and second ends and projecting outwardly from said first surface;

d. tilting means mounted in said body intermediate of said pivot means and said second end and remote from said cutting tool, said pivot means and said tilting means being longitudinally aligned with each other and with said cutting tool;

e. means for moving said pivot means between said first and said second surfaces of said elongate support body for permitting said support body to tilt about said pivot means;

f. means for actuating said moving means; and

g. carriage means resiliently mounted in said body intermediate said cutting tool and said pivot means and projecting outwardly as said second surface whereby said pivot means constantly engages the inner surface of a tubular member and said tilting means causes said cutting tool mounted at one end of said support body to move toward and away from the internal raised weld bead of the tubular member.

4,600,181

GAS COOLING AND RECIRCULATING DEVICE IN CONTINUOUS STRIP FURNACES

Giulio Falco, and Ivo Mannucci, both of Genoa, Italy, assignors to Italimpianti Societa Italiana Impianti p.a., Genoa, Italy

Filed Sep. 4, 1984, Ser. No. 647,161

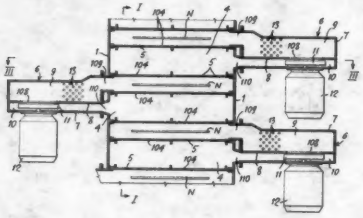
Claims priority, application Italy, Sep. 8, 1983, 12617 A/83

Int. Cl.[4] C21D *9/573*

U.S. Cl. 266—102 6 Claims

1. Apparatus for the cooling and recirculation of gas forming a protective gas in the cooling chamber of furnaces for continuous processing of a metal strip, particularly for the continuous annealing of a steel strip, which comprises a plurality of horizontally arranged boxes (4) each of which extends vertically between successive vertically extending parallel sections of the strip substantially over the whole height thereof, each of said boxes having opposed walls (104) transverse to furnace side walls, each of said opposed walls facing a respective adjacent

strip section and being provided with perforations (5), a plurality of protective gas-cooling and recirculating units 6, each of said units comprising a heat exchanger (13) and a fan (11), said fan being adapted to draw from the furnace interior the protective gas, to cool the gas by causing it to flow through the heat exchanger (13), and to blow at a certain pressure the protective gas into the boxes (4), the protective gas flowing out of the



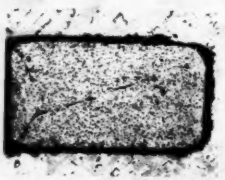
perforations (5) provided in the boxes (4) in form of jets being directed to the facing surfaces of said respective adjacent strip sections to cause cooling thereof, each of said plurality of individual cooling and recirculating units being attached to the outside of said furnace sidewalls (1) and distributed over the vertical extent of said boxes such that cooling and recirculating units which are adjacent each other are vertically staggered.

4,600,182

HIGH DENSITY, SINTERED SILICON NITRIDE CONTAINING ARTICLES AND METHODS FOR USING THE SAME TO PROCESS MOLTEN NICKEL

Richard D. Veltri, East Hartford, and Francis S. Galasso, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,632
Int. Cl.[4] C04B *35/58*; C21D *1/00*; B28B *7/00, 7/34*
U.S. Cl. 266—286 **12 Claims**



50 x

1. A method of processing nickel alloys in molten nickel alloy handling and shaping articles by melting the nickel alloy and molding the nickel alloy into a predetermined shape wherein the improvement comprises utilizing articles whose chemical composition consists essentially of polycrystalline silicon nitride having

(1) about 2% to about 5% silica;

(2) about 15% yttria; and

(3) about 0.6% to about 8% alumina;

all percents by weight, having a density greater than 3 gm/cm^3, being nonreactive with molten nickel alloys at temperatures up to 1500° C. and being resistant to thermal shock.

4,600,183

BUILDING PANEL INSTALLATION DEVICE

James R. Ogden, Box 201, Papillion, Nebr. 68046

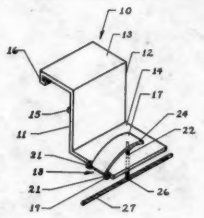
Filed Dec. 24, 1984, Ser. No. 685,456
Int. Cl.[4] B25B *5/14*
U.S. Cl. 269—43 **17 Claims**

1. A building panel installation device, comprising:

a Z-shaped bracket having an upper horizontal leg, a lower horizontal leg for supporting the building panels, and a vertical connecting member therebetween;

a plate pivotally connected along one edge to an edge of the lower horizontal leg of said bracket, said plate projecting over the top of said lower leg;

a threaded rod engaged through a threaded aperture in said lower leg, said rod having a first end contacting the lower



face of said plate and a second end projecting below said lower leg, whereby rotation of said rod will raise and lower the free end of said plate; and

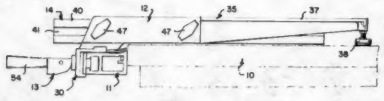
means for operably hooking said bracket to a horizontal structural member, said hooking means being affixed to the free end of the upper leg of said bracket, whereby the lower leg of said bracket will hang below and outwards from said horizontal member and support weight thereon.

4,600,184

TOOL FENCE

Steven W. Ashworth, Blue Springs, Miss., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jan. 23, 1984, Ser. No. 573,257
Int. Cl.[4] B23Q *3/02*
U.S. Cl. 269—303 **6 Claims**



2. Fence apparatus for a table saw having a circular blade, said table saw having a work table, said apparatus comprising:

an elongated guide rail attached to said work table, said guide rail having a pair of spaced apart first front walls defining a slot therebetween;

a fence;

means for carrying said fence for movement of said fence toward and away from said blade, including a base portion for sliding along said guide rail; and

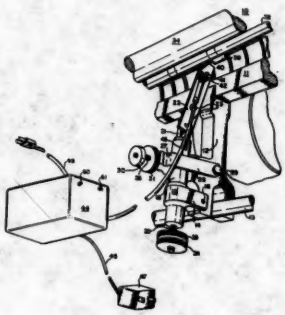
means for locking said fence carrying means to said first front walls, said locking means including an elognated lock element and means extending through said slot for effecting linear and arcuate movement of said lock element with respect to said guide rail between a first position in locking engagement with said first front walls and a second position in line with said slot, said lock element in said second position being moveable through said slot between said first front walls whereby said effecting means provides for installation, locking, and removal of said fence carrying means with respect to said guide rail.

4,600,185

APPARATUS FOR DETECTING AND ACTUATING THE FEEDING OF PAPER IN PAPER FOLDING MACHINES

Richard J. Moll, c/o Dick Moll and Sons, 415 Constance Dr., Warminster, Pa. 18974

Continuation-in-part of Ser. No. 528,438, Sep. 1, 1983, abandoned. This application Dec. 12, 1984, Ser. No. 680,816
Int. Cl.[4] B65H *39/02*; G01W *21/86*
U.S. Cl. 270—58 2 Claims



1. In combination with a folding machine for folding paper and the like, said folding machine including paper feeding means, apparatus for detecting the presence of a load of paper which comprises

an adjustable mounting bracket secured to the underside of said machine,

scanning means carried by said mounting bracket adjacent to the underside of the paper to detect the presence of a load of paper, said scanning means including a scanning head capable of emitting a series of coded light pulses and receiving the light pulses which are reflected by the paper when present, said scanning means providing an electrical detection signal upon reception of a reflected light pulse;

control means connected to said scanning means to provide and receive signals therefrom, compare said signals, and provide an output signal to the paper feeding means, whereby the paper feeding means carried by said folding machine is controlled, said control means including

a coder connected to said scanning head for providing a series of coded electrical pulse signals to the scanning head,

a decoder connected to the scanning head to receive the electrical detection signals from the scanning head,

a comparator connected to the coder and decoder to compare the electrical pulse signals and the electrical detection signals and provide an output signal indicative of matching coded signals,

a relay driver connected to the comparator to receive the comparator output signal and provide an output signal,

a relay connected to the relay driver to receive the output signal from the relay driver, and

means connected to the relay to cause the feeding means to operate upon receipt of a signal from the relay; and

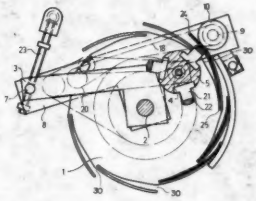
adjustment means connected to said control means for adjusting the strength of the coded light pulses from the coder.

4,600,186

METHOD AND APPARATUS FOR REDUCING THE IMPACT SPEED OF A PRINTED PRODUCT WHICH IS DELIVERED TO A FLY POCKET OF A FLY DELIVERY WHEEL IN A ROTARY PRINTING PRESS

Eduard von Hein, Bern, and Ertavi Tibor, Worb, both of Switzerland, assignors to Maschinenfabrik Wifag, Switzerland

Filed Feb. 16, 1984, Ser. No. 580,793
Claims priority, application Sweden, Feb. 21, 1983, 8300940
Int. Cl.[4] B65H *29/68*
U.S. Cl. 271—182 4 Claims



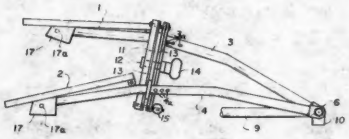
1. A device for reducing the impact speed of a printed product as it moves into a fly pocket of a rotating delivery flywheel, comprising a rotatable flywheel having a plurality of fly pockets distributed around its periphery, each pocket having a printed pocket receiving opening into each of which a printed product is directed as the flywheel is rotated, a rotatable ring rotatably mounted alongside said flywheel, and a rotatable cam plate rotatably mounted adjacent said ring and having a cam movable therearound which moves during rotation into close proximity with said ring to engage a printed product fed between said ring and said cam as it moves into the adjacent fly pocket and to brake it whereby to reduce the impact speed thereof, a support frame, said delivery flywheel having a plurality of flywheel portions each having circumferentially spaced fly pockets, the fly pockets of adjacent wheels being aligned laterally, a lever member pivotally mounted adjacent one end between adjacent flywheel portions and having an opposite end on which said cam plate is rotatably mounted, a flywheel delivery shaft rotatable in said frame and carrying said flywheel portion for rotation therewith, a ring shaft carrying said rings and being rotatable on said frame, and drive means connected between said rotatable delivery flywheel shaft and said cam plate to rotate said plate in an opposite direction to said flywheel portions.

4,600,187

STEP EXERCISER

Bruce R. Schenker, 2600 Hampton Ave., Allison Park, Pa. 15101

Filed Jun. 28, 1985, Ser. No. 749,678
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—70 4 Claims



1. A foot and leg exercising device for simulating walking up steps, comprising a support having parallel side arms interconnected at one end by a right angularly extending pivot arm, a pair of step treads attached to one end of a pair of step arms, said step arms being loosely pivoted at their other end to said pivot arm, a cross arm having ends connected to an intermedi-

ate portion of said side arms, a brake shoe upstanding from and rigidly connected to the central portion of said cross arm, a rocker plate pivotally mounted on said brake shoe and having openings at the ends thereof which loosely fit on said step arms, and bolt means for selectively compressing said rocker plate against said brake shoe to vary the resistance against rocker movements of said rocker plate.

4,600,188

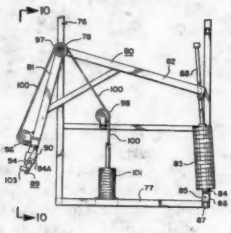
EXERCISE MACHINE FOR LIMB EXTREMITY DIGITS

Blauer L. Bangerter, and James M. Streeter, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Division of Ser. No. 617,081, Jun. 4, 1984, Pat. No. 4,577,861. This application Nov. 25, 1985, Ser. No. 801,418

Int. Cl.[4] A63B *23/04*

U.S. Cl. 272—96 **1 Claim**



1. In a leg press machine having a framework provided with a horizontal support bar; an angle member having integral legs meeting in a medial apex portion journalled to and supported by said support bar, one of said legs being provided with weight means, and the remaining leg having a foot support cross member: an improvement wherein said foot support cross member is provided with digits' support means pivotally attached to and essentially disposed in the same plane of said foot support cross member, when disposed in a medial-point operative position; pulley means supported by said framework; a second weight means; and cable means passing over and supported by said pulley and having one end coupled to said digits' support means proximate a forward outer margin thereof and the remaining end coupled to said second weight means, whereby a user can do toe flexion exercises in addition to or in lieu of leg press exercises.

4,600,189

MULTI-FUNCTION EXERCISE SYSTEM

Brad Olschansky, and Scott Olschansky, both of Timonium, Md., assignors to Lifeing, Inc., Sparks, Md.

Filed Apr. 11, 1984, Ser. No. 597,731

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—118 **19 Claims**

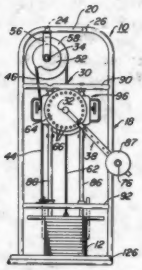
1. A multi-function exercise system for reversibly displacing at least one weight element in a substantially vertical direction responsive to a lifting force imparted to said weight element by a user, comprising:

(a) a base frame;

(b) rotative pulley means displaceably coupled to said base frame and at least one weight element, said rotative pulley means having a first pulley axis and a second pulley axis;

(c) actuating bar means coupled to said rotative pulley means for rotationally displacing said rotative pulley means and linearly displacing said weight element responsive to a rotative force applied by said user;

(d) means for vertically adjusting said rotative pulley means with respect to said base frame said vertical adjusting means for displacing said first pulley axis reversibly in said vertical direction, said second pulley axis being non-displaceable in said vertical direction; and,



(e) means for rotationally adjusting said actuating bar means with respect to said rotative pulley means about said first pulley axis.

4,600,190

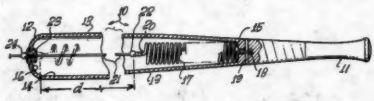
EXERCISING DEVICE

Andrew J. Berokoff, 7761 Bowen Dr., Whittier, Calif. 90602

Filed Nov. 23, 1984, Ser. No. 674,152

Int. Cl.[4] A63B *21/04*

U.S. Cl. 272—136 **5 Claims**



1. An exercising device comprising:

bat means having a handle end and a tip, said bat means having a compartment longitudinally positioned therein, said compartment having a handle end and a tip end;

biasing means having a first and second end, said biasing means being affixed at the first end to the bat means at one end of the compartment and being held completely within said compartment;

inelastic line means having a bat end and an external end, the bat end of the line means being attached to the second end of said biasing means and being attachable at its external end to stationary holding means; and

guide means held by said bat means at the tip thereof, said guide means forming a passageway between the tip end of said compartment and the exterior of said bat, said guide means surrounding said line means.

4,600,191

BOWLERS AID

Lewis Agius, 7730 Claymore Ct. E., Canton, Mich. 48187

Continuation-in-part of Ser. No. 560,230, Dec. 12, 1983, abandoned. This application Nov. 29, 1984, Ser. No. 676,771

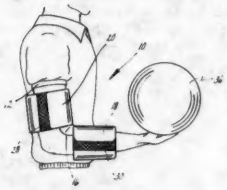
Int. Cl.[4] A63B *71/04*

U.S. Cl. 273—54 B **4 Claims**

1. A device for locking a bowler's elbow against bending, comprising:

an elongated shell forming a segment of a cylinder having a concave side and a convex side, the concave side thereof being adapted to be mounted adjacent the biceps and inner forearm of the user in an unbent position, the shell having a sufficient stiffness to prevent any bending thereof by the user's arm on which the shell is mounted from said unbent position, the longitudinal midsection of the shell being bendable such that the convex side of one end of the shell is movable toward the convex side of the opposite end

thereof, but only in response to means applied to the convex side of the midsection of the shell for moving the midsection in a direction normal to the longitudinal axis of the shell; and



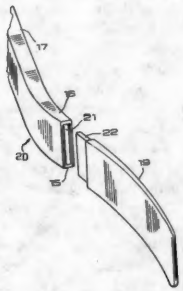
securing means for mounting the shell in close fitting relationship on the user's arm adjacent the biceps and inner forearm thereof.

4,600,192

HOCKEY STICK MANUFACTURE

Yutaka Adachi, 77 Saskatoon Drive, Weston, Ontario, Canada, M9P 2G1

Filed Jun. 11, 1984, Ser. No. 619,320
Int. Cl.[4] A63B *59/14*
U.S. Cl. 273—67 A **9 Claims**



1. Method of making a hockey stick from fibre-reinforced plastic material;

wherein the hockey stick has a handle, a blade, and a transition portion;

where the cross-sectional profile of the handle is different from the cross-sectional profile of the blade both in breadth and thickness;

and where the cross-sectional profile of the transition portion changes smoothly and progressively from the profile of the handle to the profile of the blade;

where the method includes the steps of:

providing a press, and moulds for the press which include a channel-shaped die having a channel, and a core formed as a mandrel;

moudling at least a portion of the stick to shape in the said moulds;

providing a mat of fibre reinforcing material, wrapped around said core with the edges being overlapped, and impregnating said mat with resin;

compressing the impregnated mat between the core and the channel by a plunger;

and maintaining the core and channel relatively stationary until the resin has cured;

where the portion of the stick that is moulded to shape in the moulds includes the handle and at least a part of the transition portion; and

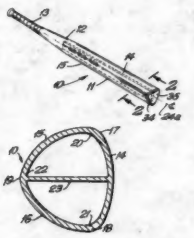
wherein the mandrel is located with respect to the channel by engaging the mandrel to the blade of the hockey stick, and by engaging the blade in the die.

4,600,193

HOLLOW BAT

William Merritt, 350 First Ave., New York, N.Y. 10010

Filed Sep. 19, 1983, Ser. No. 533,437
The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.
Int. Cl.[4] A63B *59/06*
U.S. Cl. 273—72 A **7 Claims**



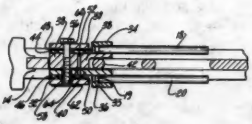
1. A baseball bat comprising a hollow, unitary elongated head of substantially triangular cross-sectional shape, an elongated handle and an elongated intermediate portion interconnecting the head and the handle, said head having an elongated, arcuate, ball hitting portion, two elongated somewhat arcuate side members laterally disposed on each side of the ball hitting portion and converging to form a corner of the triangular cross-sectional shape opposite the said hitting portion, and elongated brace means internally carried by the head between the ends of the arc of the ball hitting portion and structurally secured to at least one of the elongated side members to divide the unsupported portion of the ball contacting surface into at least two segments and distribute the impact of a force applied to the said large ball contacting surface directly to at least one of the side members of the bat.

4,600,194

ANTI-VIBRATION DEVICE FOR SPORTS RACKETS

Norbert B. Donnelly, 1505 N. Front St., Niles, Mich. 49120

Filed Dec. 22, 1983, Ser. No. 564,317
Int. Cl.[4] A63B *49/00*
U.S. Cl. 273—73 G **9 Claims**



1. For use with a sports racket having a head portion at one

end of the racket, a handle at the other end of the racket and a central throat portion between the head portion and the handle, a vibration damping device comprising:

a housing including coacting clamp members;

fastener means operative upon tightening to secure said coacting clamp members to opposite faces of the throat portion of the racket;

damping means including an elongate rod means; and

means operative to clamp one end of said elongate rod means between said coacting clamp members so that said rod means extends in cantilever fashion from said clamp members within the central throat portion of the racket;

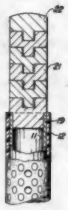
whereby a first vibration of the head portion of the racket induces a second vibration in the elongate rod means, resulting in a damping of the first vibration and reduction in the transmission of vibration to the handle of the racket.

4,600,195

WEIGHTED GOLF CLUB HANDLE

James J. Hunter, P.O. Box 3117, 52 Chapman Ct., Page, Ariz. 86040

Filed Mar. 11, 1985, Ser. No. 710,656
Int. Cl.[4] A63B *53/16*
U.S. Cl. 273—81 A **3 Claims**



1. An improved golf club wherein the player can alter both club weight and swing weight, said club comprising:

(a) a hollow shaft having a free end and an opposing end with a longitudinal axis extending therebetween;

(b) a club head affixed to said opposing end for contacting a golf ball;

(c) hand-grippable means located on said shaft proximate to the free end thereof;

(d) a first cylindrical weight having a first solid region of reduced diameter for insertion into the free end of said hollow shaft and a second region having a diameter equal to the outside diameter of said shaft and containing a threaded receiving means in alignment with said longitudinal axis;

(e) a second cylindrical weight having first and second ends, said second weight having a uniform outside diameter equal to the diameter of the second region of said first weight, said first end including a threaded fastening means in alignment with said longitudinal axis for coupling to the receiving means of said first weight; said second end containing a receiving means in alignment with said longitudinal axis; and

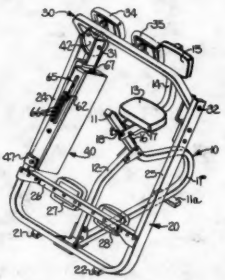
(f) a solid weight having a threaded fastening means extending outwardly at one end thereof for engagement with said second weight and a smooth contour at the opposing end, the removal of said second weight altering club weight and swing weight of said golf club.

4,600,196

EXERCISING MACHINE WITH VARIABLE RESISTANCE

Arthur A. Jones, Lake Helen, Fla., assignor to Nautilus Sports/-Medical Industries, Inc., Lake Helen, Fla.

Continuation-in-part of Ser. No. 459,508, Jan. 20, 1983, Pat. No. 4,500,089. This application Oct. 24, 1984, Ser. No. 664,080
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 **20 Claims**



1. An exercising machine including a frame, support means on said frame for supporting the user thereon, exercising lever means including one end supported for pivotal movement on said frame and an opposite end adapted to be engaged by a portion of the body of the user and movable in an arcuate path between first and second positions, elongate resilient means including one end connected in fixed relationship to said frame and an opposite end connected to said exercising lever means, said elongate resilient means normally being in contracted condition to maintain said exercising lever means in said first position of the arcuate path, said elongate resilient means being stretchable by the user applying pressure to said other end of said exercising lever means to move said exercising lever means to said second position, and selector means operatively engageable along the effective length of said elongate resilient means for varying the effective length of said elongate resilient means to thereby vary the amount of resistance force required to move said exercising lever means a given amount of pivotal movement.

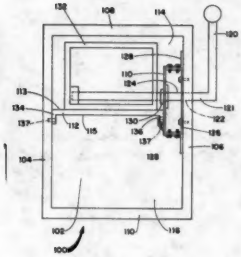
10. An exercising machine particularly adapted for exercising the abdominal muscles of the user and comprising an upstanding main frame section including front, rear, upper and lower portions, said lower portion being supported on a floor or the like, a seat supported on the upper portion of said upstanding main frame, a substantially U-shaped auxiliary frame fixed at its lower medial portion to the front portion of said main frame and including upstanding legs extending rearwardly at an acute angle and forwardly of said seat, said legs including upper ends terminating above the level of said seat and corresponding with the level of the waist of the user, a substantially U-shaped exercising lever having opposite end portions of the legs thereof pivotally connected to the upper ends of said upstanding legs of said auxiliary frame, said exercising lever including pad means positioned on the medial portion thereof for engagement by the shoulders of the user, said exercising lever normally being positioned in substantially a right-angular relationship with said upstanding legs of said auxiliary frame and with said pad means in position to be engaged by the shoulders of the user when in an upright seated position on said seat, and resistance force means operatively connected to said exercising lever for resisting movement of said exercising lever forwardly and downwardly in a positive exercising movement.

4,600,197

BEARING STOP PLATE ASSEMBLY FOR SLOT MACHINE HANDLE MECHANISM

Jack Bean, 33 Gerald Pl., Bayville, N.J. 08721

Filed Mar. 22, 1985, Ser. No. 714,901
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—143 R 3 Claims



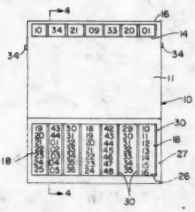
1. A bearing stop plate assembly for slot machines for support of the reel shelf and alignment of the reel mechanism and handle mechanism comprising a bearing plate having a first side and a second side; perimeter flanges perpendicular to said second side, said perpendicular flanges having a plurality of openings for securing said bearing plate in said slot machine; a horizontal slide guide extending outwardly from said first side of said bearing plate for cooperation with a downwardly depending lip of said reel shelf; a plurality of openings in said horizontal slide guide to receive threaded fastening means for securing said reel shelf; a plurality of openings through said bearing plate for the positioning and alignment of said handle and reel mechanism.

4,600,198

LOTTO CONTEST NUMBER CHECKING DEVICE

Delbert H. Fox, 841 Southwood Dr., Fenton, Mich. 48430

Filed Nov. 28, 1984, Ser. No. 676,755
Int. Cl.[4] A63F 3/06
U.S. Cl. 273—148 R 4 Claims



1. A lotto ticket checking device for comparing a winning number to a plurality of preselected numbers printed in rows and columns on the ticket, comprising;

a case;

a first, viewing opening in the upper surface of said case proximate one end thereof;

a plurality of indicia bearing tapes rotatively mounted side by side in said case and registerable to a position displaying the digits of the winning number through said opening;

a second opening proximate the other end of the case and extending through its upper surface for permitting thumbing of each tape into its position relative to said viewing opening; and

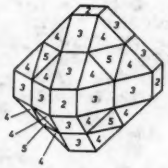
a plurality of pegs mounted on the lower surface of said case for facilitating its sliding movement lengthwise over a lottery ticket in a row by row fashion.

4,600,199

THREE DIMENSIONAL PUZZLE

Udo Krell, Klovensteenweg 121, 2000 Hamburg 56, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,402
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138663
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 S 34 Claims



25. A three-dimensional puzzle having a geometric shape, said puzzle comprising an inner fastening means including a center element formed as a six-armed cross with each arm thereof receiving a respective one of a plurality of intermediate parts and end parts; said center element, said intermediate parts, and said end parts forming a plurality of free spaces arranged to receive additional fastening means; at least twenty building blocks, each block having an outer face, the combination there of along with the outer surfaces of the end parts forming the geometric shape of said puzzle, said blocks being positioned on and attached to said inner and additional fastening means, said blocks having means for movement about the axes of said cross; said blocks being positioned in layers, said layers being of equal thickness and in relative parallel relationship.

4,600,200

THREE-DIMENSIONAL IMAGE DISPLAY SYSTEM

Masaya Oka, and Sumio Nakagawa, both of Kawasaki, Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,334
Claims priority, application Japan, Jan. 14, 1982, 57-4139
Int. Cl.[4] A63B 71/00; G06F 15/626; G09B 9/08
U.S. Cl. 273—313 19 Claims

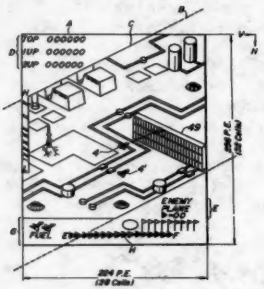
1. A three-dimensional image display system, comprising:

(a) memory means for storing video information in the form of a prespective view of a background scene;

(b) reading means for reading out said video information stored in said memory means while scrolling the stored video information in an oblique direction with respect to said perspective view; and

(c) display means, including a display screeen and responsive to the read out scrolled video information, for displaying said read out video information in the form of a perspec-

tive view on said display screen with the displayed picture being obliquely scrolled, with respect to the horizontal



axis of said display screen, in said display screen in accordance with the lapse of time.

4,600,201

IMPREGNATED FLAT SEALING GASKET AND METHOD OF MAKING THE SAME

Klaus Lönne; Klaus-Peter Majewski, and Hans-Rainer Zerfass, all of Burscheid, Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Mar. 7, 1985, Ser. No. 709,289

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408596

Int. Cl.[4] F16J *15/10;* **B32B** *31/12, 31/26*

U.S. Cl. 277—1 **13 Claims**

1. In a method of making a flat gasket comprising a nonwoven mat having opposite faces, including the steps of impregnating the mat with a polymerizable liquid impregnating agent, applying to at least one part of at least one mat face a coating containing a polymerizable polymer material, the improvement wherein the coating is applied to the impregnated mat prior to polymerization of the impregnating agent and simultaneously polymerizing the impregnating agent and the coating in one operation.

4,600,202

FLEXIBLE BRUSH-TYPE SEAL WITH LAYERED MOVING SEALING SURFACE

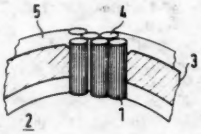
Arthur Schaeffler, Vierkirchen, and Klemens Werner, Munich, both of Fed. Rep. of Germany, assignors to MTU Motoren - und Turbinen-Union Muenchen GmbH, Fed. Rep. of Germany

Filed Aug. 8, 1985, Ser. No. 763,656

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1984, 3429708

Int. Cl.[4] F16J *15/12, 15/447*

U.S. Cl. 277—53 **20 Claims**



1. A brush-type seal for at least two machine components relatively movable to each other and at least one of which is rotatable, the brush-type seal comprising a plurality of bristles in an envelope, wherein a bristle includes a core portion attached to one of the components and having elastic properties and a layer portion providing a continuously moving sealing surface to another of said components and made from a material different from that of the core portion.

4,600,203

SLIT-TYPE SEALING ARRANGEMENT FOR ENCAPSULATED MEASURING SYSTEM

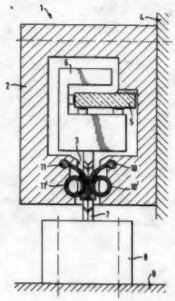
Walter Miller, Traunstein, and Heinz Kraus, Traunreut, both of Fed. Rep. of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,481

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3410944

Int. Cl.[4] F16J *15/16, 15/32;* **G01B** *11/04*

U.S. Cl. 277—237 R **10 Claims**



1. In an encapsulated measuring system for measuring the position of first and second objects movable relative to each other, of the type comprising a housing, adapted to be connected to the first object, which defines a slit extending along a measuring direction, a scanning unit disposed in the housing, and a follower, adapted to be connected to the second object and coupled to the scanning unit to move along the measuring direction and to extend through the slit, said follower having a convex shape in the measuring direction, the improvement comprising:

a pair of multipart sealing elements, each multipart sealing element mounted to the housing on a respective side of the slit to extend along the measuring direction, each multipart sealing element comprising a sealing profile shaped to seal against the follower and an elastic supporting element having a length dimension extending along the measuring direction and shaped to bias the respective sealing profile into sealing engagement with the follower;

the sealing profiles positioned to abut and seal against one another across the slit; and

said follower operating to indent the elastic supporting elements such that the elastic supporting elements are indented maximally in a region aligned with the follower, which region moves along the length of the supporting elements as the follower moves along the measuring direction.

4,600,204

CORNER BUMPER FOR SHOPPING CART

Ronald L. Badger, Battle Creek, Mich., assignor to United Steel & Wire Company, Battle Creek, Mich.

Continuation-in-part of Ser. No. 613,858, May 24, 1984, abandoned. This application Feb. 19, 1985, Ser. No. 702,517

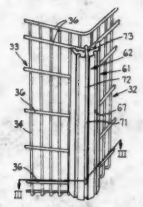
Int. Cl.[4] B62B *3/00*

U.S. Cl. 280—33.99 A **15 Claims**

1. In a shopping cart having a wheeled base and an upwardly opening basket mounted on said base in upwardly spaced relationship therefrom, said basket including a front wall which extends between and rigidly joins to a pair of side walls,

said front wall where it joins to said side walls defining a pair of front corners, said front and side walls being of a meshlike construction formed from a plurality of transversely extending rods which intersect and are joined together, said plurality of rods including a plurality of substantially horizontally extending rods which are vertically spaced apart, and a bumper arrangement attached to said basket in the vicinity of each said corner, the improvement wherein said bumper arrangement comprises:

a vertically elongated striplike bumper formed of a synthetic resin material, said bumper being positioned closely adjacent the exterior side of said corner and extending through a vertical extent which is a majority of the vertical extent of said corner;



said bumper having a substantially L-shaped cross section and an inner surface which is adapted to abuttingly engage the horizontal rods defining said basket in the vicinity of said corner, said inner surface having a configuration which closely corresponds to the configuration of said corner so that said bumper can closely conform to said corner;

lower hook means stationarily secured to said bumper adjacent the lower end thereof and projecting inwardly and downwardly therefrom for engagement with a said horizontal wire;

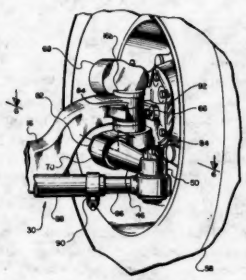
upper hook means associated with the upper end of said bumper for engagement with a second said horizontal wire which is vertically spaced upwardly from said first horizontal wire.

4,600,205

STEERING APPARATUS FOR MOTOR VEHICLES

Denzil S. Stewart; Alfred J. Bland, both of Canoga Park, and Donald D. Rogers, Moorepark, all of Calif., assignors to Steering Control Systems, Inc., Canoga Park, Calif.

Filed Oct. 5, 1984, Ser. No. 658,304
Int. Cl.[4] B62D *7/08*
U.S. Cl. 280—95 R **16 Claims**



8. A steering control system for the front end of a roadable vehicle with a transversely mounted front axle having opposite ends upon which a pair of steerable wheels are mounted via a king pin through a king pin assembly having a spindle member extending outward from the wheel and positioned inwardly of the king pin, the improvement comprising:

a pair of steering arms each including a straight shank portion having a straight first axis and being fixedly attached to one of the spindle members;

a control arm portion of said steering arm angled generally rearward and outward along a second axis toward its adjacent wheel and terminating in a boss member drilled for attachment of a tie rod; and

a double ended tie rod connected to said boss members and thereby interconnecting said steering arms and of a length to provide a toe out wheel condition,

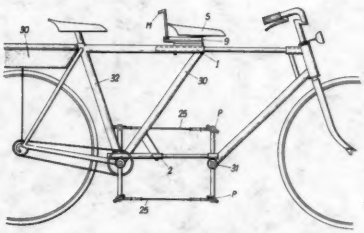
whereby the foregoing combination results in a truer rolling action and a tighter turning radius than in conventional systems.

4,600,206

DEVICE FOR TRANSFORMING CYCLES OR SIMILAR INTO MULTIPLE CAPACITY VEHICLES FOR MORE OCCUPANTS

Giancarlo Di Paolo, Via Canzone del Piave, 51, 00144 Roma, Italy

Filed Aug. 3, 1984, Ser. No. 637,366
Claims priority, application Italy, Jul. 18, 1984, 48587 A/84
Int. Cl.[4] B62K *13/02*
U.S. Cl. 280—231 **8 Claims**



1. A convertible bicycle adapted to accommodate one or more riders comprising a stationary tubular framework structure and a telescopically extendible tubular framework structure, said framework structures having telescopically engaging upper horizontal tubes, and horizontal lower telescopically engaging means for selectively spacing-apart said stationary and said extendible structures; a stationary saddle on said stationary framework structure; a removable saddle; support means rigidly fixed onto said upper horizontal tube of said stationary framework for securing said removable saddle forwardly of said stationary saddle; a permanent pedal crank and pedal group; a removable pedal crank and pedal group; said stationary framework structure further including a first slant tube and a second slant tube respectively connected at their upper ends with the forward and rearward ends of said upper horizontal tube, said first and second tubes being connected together at their lower ends to form permanent pedal crank housing; a first rear wheel fork extending from the rearward end of said upper horizontal tube to engage the rear wheel hub, a second rear wheel fork connected at one end of the lower end of said first fork and connected at its other end to the lower ends of said first and second slant tubes; said extendible framework structure including a third slant tube, a fore wheel fork supported in said third slant tube, a handle bar connected to said fore wheel fork, a fourth slant tube having its upper end connected with the lower portion of said third slant tube and its lower end connected to one end of said lower telescopically engaging means of said extensible framework structure; said lower end of said fourth slant tube having a housing for mounting a removable pedal crank; adjustable coupling means for

coupling the permanent pedals and said removable pedals; and fastening means on said stationary horizontal upper tube and said stationary lower telescopically engaging means for securing therein said extendible upper horizontal tube and said extendible lower telescopically engaging means in selective spaced-apart relation.

4,600,207

CONNECTION OF STEERING COLUMN TO FRAME

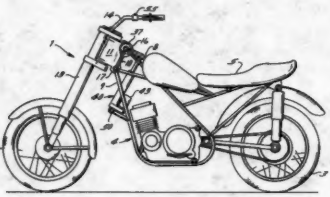
Michael Zosi, Rennaz, Switzerland, assignor to Bernd Grohe, Les Cretes, Switzerland

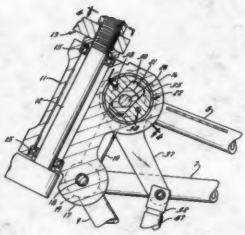
Continuation-in-part of Ser. No. 533,295, Sep. 19, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,161

Claims priority, application Switzerland, Sep. 27, 1982, 5674/82

Int. Cl.[4] B62K *3/02*

U.S. Cl. 280—279 **4 Claims**





1. A motorcycle having a frame, a rear wheel mounted on the frame for rotation on a rear wheel axis that has a fixed orientation relative to the frame, a tubular steering column support on the frame that has upper and lower ends and defines an upwardly and rearwardly inclined steering axis, a front wheel, and a steering column with which said front wheel has a connection and which extends coaxially through the steering column support and is confined to swiveling therein about the steering axis to provide for steering displacement of the front wheel relative to the frame, said motorcycle being characterized by:

A. trunnion means connecting the frame and one end portion of said steering column support and defining a pivot axis which is parallel to said rear wheel axis and about which the other end portion of the steering column support is swingable forwardly and rearwardly relative to the frame;

B. means providing an adjustable connection between the frame and said other end portion of the steering column support, comprising

(1) a shaft carried by the frame and having a shaft axis which is in fixed relation to the frame and which is parallel to said pivot axis and vertically spaced a substantial distance therefrom,

(2) a driver on said shaft having a portion which is eccentric to said shaft axis and which is confined by said shaft to swinging in opposite directions about the shaft axis to be carried thereby in opposite forward and rearward directions relative to the frame; and

(3) surface defining means carried by said steering column support near said other end thereof and providing a pair of opposing surfaces between which said portion of the driver is slidingly confined and whereby components of motion of the driver in said forward and rearward directions are imparted to said other end of the steering column support while sliding of the driver along said surfaces accommodates vertical components of swinging motion of the driver;

C. an actuating arm which extends substantially transversely to said shaft and has a connection with said driver whereby swinging of said arm constrains the driver to swing in unison therewith about said shaft axis; and

D. actuating means reacting between said frame and said actuating arm for adjustingly swinging the latter and holding it in selected positions of its swinging motion.

4,600,208

SPEAKER SYSTEM FOR MOTORCYCLES

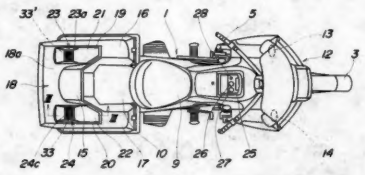
Kazuo Morishima, Shiki, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 1, 1985, Ser. No. 750,546

Claims priority, application Japan, Jul. 6, 1984, 59-102037[U]

Int. Cl.[4] B62J *39/00*

U.S. Cl. 280—289 A **13 Claims**



1. A motorcycle comprising: a frame body having opposite lateral sides; a pair of front and rear seats mounted on said frame body; a receptacle mounted on said frame body at a location rearward of said rear seat; and a pair of speakers arranged on said receptacle at said opposite lateral sides of said frame body, said speakers each having a front surface thereof directed forwardly upwardly of said frame body.

4,600,209

TRANSPORT SUPPORT FOR FREESTANDING UMBILICAL ACCESSORY

Robert L. Kerr, Jr., 6532 W. Palm La., Phoenix, Ariz. 85035

Filed Jul. 2, 1984, Ser. No. 626,716

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—400 **16 Claims**

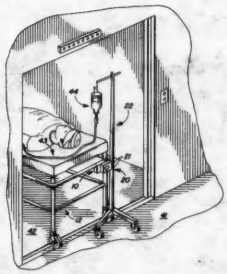
15. In a transport system wherein a transport vehicle having a relatively low center of gravity is used in conjunction with a freestanding transportable accessory and wherein at least one of said transporting vehicle and a person carried thereby is physically attached to said freestanding transportable accessory by umbilical means, an improved apparatus for selectively releasably securing said freestanding transportable accessory to said transporting vehicle for preventing said freestanding transportable accessory from tipping over ad the like, said improved apparatus comprising:

a first member including means for releasably securing same to at least a portion of said transporting vehicle;

a second member including means for releasably securing same to at least a portion of said freestanding transportable accessory said first and second members being substantially identical; and

means carried by said first and second members for releasably securing said first and second members immovably

together, (2) angularly positioning said freestanding transportable accessory with respect to said transporting vehicle, and (3) for producing a relatively immovable combination of said transporting vehicle and said transportable



accessory which moves as a single integral unit such that said secured combination is a significantly lower center of gravity than did said freestanding transportable accessory alone thereby stabilizing said freestanding transportable accessory to prevent tipping and the like.

4,600,210

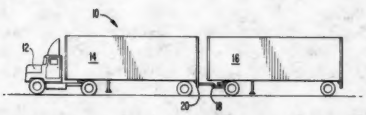
TANDEM TRAILER DOLLY

Wade G. McMurray, 1504 Pineola Ave., Kingsport, Tenn. 37664

Filed May 14, 1985, Ser. No. 734,333

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—408 **5 Claims**



1. A dolly combination for connecting a rear end of a lead trailer pulled by a truck tractor in tandem with a second trailer, comprising:

an axle having two ends;

wheels rotatably mounted on the two ends of the axle;

a fifth wheel secured and centered above the axle;

a body for securing the fifth wheel to the axle and having a front end;

a tongue rigidly protruding from the front end of the body;

an A-frame converging toward the front end of the body and having front legs and a rear apex;

a sleeve being attached to the rear apex of the A-frame and being swivelable about the tongue to a desired angle;

at least two eye hooks spaced apart from each other and attached to the front legs of the A-frame;

stop means, connected to the front end of the body, for simultaneously preventing longitudinal movement of the sleeve and limiting angular rotation of the sleeve about the tongue;

whereby the dolly is easily hooked to the rear end of the lead trailer when on uneven ground and backing up of the lead trailer in tandem with the second trailer is controlled by the truck tractor because there are only two vertical articulation axes in the whole combination of the truck tractor, the lead trailer, the dolly, and the second trailer.

4,600,211

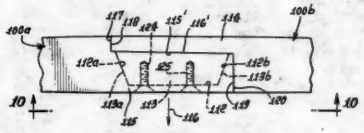
SECTIONED SKI

Glenn H. Schmidt, 1857 Los Encinos, Glendale, Calif. 91208

Division of Ser. No. 292,787, Aug. 14, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,537

Int. Cl.[4] A63C *5/02*

U.S. Cl. 280—603 **4 Claims**



1. In a ski,

(a) first and second ski sections having end portions which are interconnectible end-to-end,

(b) said first ski section having a recess sunk in said end portion thereof and said second ski section having a tongue projecting from said end protion thereof, said recess and tongue shaped to closely interfit when said ski sections are assembled, end-to-end, thereby forming a full length ski,

(c) and means to positively and releasably interconnect said end portions in an assembled condition,

(d) said tongue having a wedging interfit with said recess and projecting in an interfit direction generally normal to the plane of the ski top surfaces to be completely enveloped and everywhere concealed and spaced inwardly from all outer surfaces of the ski sections, and including interengaged stopshoulders on the end walls of said end portions said the tongue tapering in the direction of insertion into the recess,

(e) said end portions having mutually overlapping-underlapping extents, each end portion having a width which is substantially the same as the full width of the ski and continuing substantially throughout the length of said overlapping-underlapping extents, the end portion of said first ski section having a planar surface surrounding said recess which engages a corresponding surface at the base of the tongue on the end portion of said second ski section, said sections further having pairs of adjacent shoulders proximate opposite ends of said planar surface and extending outwardly therefrom towards the outer surfaces of the ski sections,

(f) said means to interconnect said ski section end portions including fastener elements extending from said one ski section end portion into a terminal end portion of the tongue when fully inserted into said recess, and confined between upper and lower planes defined by the outer surfaces of the two ski sections, and

(g) said tongue having an overall length dimension in the direction of the ski length which is substantially greater than the of said section overall thickness.

4,600,212

ELECTRONIC SKI BINDING AND A METHOD FOR ITS OPERATION

Walter Knabel, Murnau, Fed. Rep. of Germany, assignor to Marker International Company, Salt Lake City, Utah

Filed Mar. 5, 1985, Ser. No. 708,288

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1984, 3408129

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—611 **11 Claims**

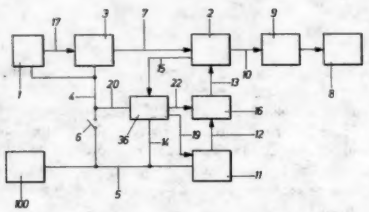
1. An electronic ski binding having a latched condition for retaining a ski boot in the binding and a released condition for releasing a ski boot from the binding, said electronic ski binding comprising:

an energy source for supplying electrical energy to the binding;

transducer means electrically connected to said energy source for generating electrical signals in response to forces applied by a ski boot to said binding;

release circuit means electrically connected to said transducer means for generating release signals when said signals from said transducer means exceed a predetermined value;

release capacitance means electrically connected to said release circuit means for generating actuating signals in response to the generation of release signals by said release circuit means;



electro-mechanical means electrically connected to said release capacitance means for effecting the release of said binding in response to said actuating signals;

recharging means electrically connected to said energy source and to said release capacitance means for connecting said energy source to said release capacitance means for recharging said release capacitance means in response to control signals; and

recharge control means electrically connected to said release capacitance means and to said recharging means for determining the energy level of said release capacitance means, and for generating control signals to said recharging means when the energy level of said release capacitance means falls below a first energy value.

4,600,213

SAFETY SKI-BINDING HAVING A SOLE PLATE

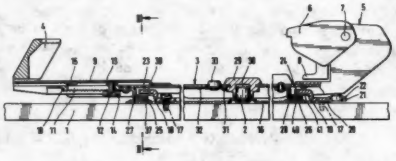
Gerhard Sedlmair, Farchant, and Walter Knabel, Murnau, both of Fed. Rep. of Germany, assignors to Marker International Company, Salt Lake City, Utah

Filed Apr. 23, 1985, Ser. No. 726,118

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1984, 3415272

Int. Cl.[4] A63C *9/081*

U.S. Cl. 280—618 **11 Claims**



1. A safety ski-binding releasable from a latched condition in response to the occurrence of an external force exceeding a predetermined force setting of the binding, said binding comprising

sole plate means mountable on a ski for pivotable movement about an axis perpendicular to the surface of the ski;

tongue means operatively associated with said sole plate means and with said base plate means, said tongue means having a lower surface with configuration of the letter W;

lower support means fixable on the ski opposite the W-shaped lower surface of said tongue means, said lower support means being engageable with the tips of said W in the absence of a sideways load on the binding; and said W-shaped lower surface being inclined to engage said lower support means upon the occurrence of a downward and sideways load to compensate for the effect of friction on said internal force.

4,600,214

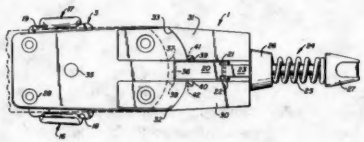
SKI BOOT LOCATING APPARATUS

Richard G. Spademan, Box 6410, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 470,128, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 255,623, Apr. 20, 1981, Pat. No. 4,407,520. This application Jan. 30, 1985, Ser. No. 696,301

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—624 **8 Claims**



1. In a ski binding adapted to be attached to a ski for securing a ski boot having a sole and a heel to the ski, the boot including longitudinally extending edges protruding laterally from the sole, and the binding including lateral clamping members adapted to be closed against the laterally protruding edges for engaging the laterally protruding edges and thereby securing the boot to the binding and the ski, the improvement comprising: positioning means for securing the heel against longitudinal movement and for longitudinally centering the boot relative to the binding while the boot is being moved towards the binding in a direction generally perpendicular to the sole, the positioning means being adapted to release the heel of the boot when the sole is in a position proximate the binding and in which the jaws are in substantial operative alignment with the laterally protruding edges, and means operatively coupled with the binding for moving the heel of the boot away from the positioning means in response to the closure of the binding and the engagement of the laterally protruding edges by the jaws.

4,600,215

VEHICULAR SUSPENSION CONTROL SYSTEM WITH VARIABLE DAMPING CHARACTERISTICS DEPENDING UPON ROAD CONDITION AND VEHICLE SPEED

Junsuke Kuroki, and Fukashi Sugasawa, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 27, 1985, Ser. No. 706,279

Claims priority, application Japan, Feb. 29, 1984, 59-37984

Int. Cl.[4] B60G *17/08*

U.S. Cl. 280—707 **8 Claims**

1. A suspension control system for an automotive vehicle comprising:

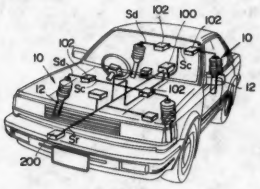
a damper means interpositioned between a vehicle body and a road wheel for absorbing, at least in part, relative displacement between the vehicle body and the road wheel, said damper means having damper characteristics selectably variable between a first weaker damping characteristics mode and a second stronger damping characteristics mode;

a first sensor producing a first sensor signal, the amplitude and frequency of which correspond to the amplitude and frequency of vibrations of the vehicle body;

a second sensor adapted to produce a second sensor signal indicative of a vehicle speed;

a filter means receiving said first sensor signal and outputting a filter signal representative of the amplitude of a specific frequency range of said sensor signal;

a comparator means receiving said filter signal and comparing the amplitude thereof with a reference value, said comparator means producing a comparator signal when the filter signal value is greater than the reference value;



a reference signal generator for transmitting said reference signal to said comparator means, said reference signal generator being responsive to said second sensor signal to vary the value of said reference signal based thereon;

a controller associated with said damper means for normally operating the latter in said first softer damping characteristics mode, said controller being responsive to said comparator signal to operate said damper means in said second harder damping characteristics mode.

4,600,216

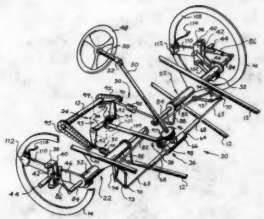
VEHICLE STEERING AND SUSPENSION SYSTEM

Dennis L. Burkholder, Etowah, N.C., assignor to John Shuttleworth, Hendersonville, N.C.

Filed May 9, 1985, Ser. No. 732,093

Int. Cl.[4] B62D *9/02*

U.S. Cl. 280—772 **22 Claims**



1. In a wheeled vehicle of the type having a vehicle frame, two steerable wheels mounted on opposite transverse sides of said frame, and at least one wheel mounted on said frame at a longitudinal spacing from said steerable wheels, an improved steering and suspension means for said steerable wheels of said vehicle comprising:

(a) respective support means for said steerable wheels pivotably mounted independently at said opposite sides of said frame about respective generally horizontal axes, each said support means including tube means rotatably supported generally horizontally on said frame to define the respective said horizontal axis and support arm means fixed to said tube means and operably connected to the respective said steerable wheel for vertical movement of said support arm means and the respective said steerable wheel integrally with rotational movement of said tube means;

(b) respective resilient biasing means affixed independently to said tube means for movement integrally with rotation thereof and operatively connected to said frame for urging the respective said support means and the respective said steerable wheel into an equilibrium position vertically with respect to said frame and for yielding to permit independent pivotal movement of the respective said support means and corresponding vertical movement of the respective said steerable wheel; and

(c) steering means for controlling synchronous corresponding turning movement of said steerable wheels about respective generally vertical axes generally perpendicular to said horizontal axes, said steering means including connecting means operatively connected respectively to said steerable wheels for reciprocatory movement for actuating said turning movement thereof, said connecting means including rod means supported co-axially within said tube means for longitudinal reciprocal movement therein for actuating said turning movement of said steerable wheels.

4,600,217

APPARATUS FOR MOVING THE TONGUE OF A SEAT BELT INTO A POSITION FOR EASY INSERTION INTO A BUCKLE

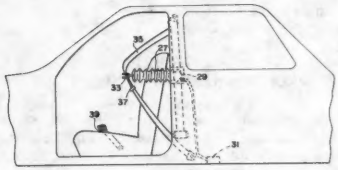
Fritz Naumann, Stammham, and Hans-Günther Haldenwanger, Ingolstadt, both of Fed. Rep. of Germany, assignors to Audi AG., Ingolstadt, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 674,590

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343619

Int. Cl.[4] B60R *21/10;* **A62B** *35/00*

U.S. Cl. 280—808 **15 Claims**



1. An apparatus for automatically moving the tongue of a seat belt from a storage position within an automotive vehicle to a position for convenient manual insertion into a buckle, comprising:

a seat belt including tongue means movable between a retracted position and an extended position;

inflatable means connectible to a source of pressure for movement between a retracted storage condition and an extended condition;

means for operatively connecting the inflatable means and the tongue means at least during movement from the retracted condition to extended condition for moving the tongue to the extended position; and

means for controlling the movement of the inflatable means such that in its extended condition it puts the tongue substantially into the position for convenient manual insertion into the buckle.

4,600,218

SEPARABLE HIGH PRESSURE GAS LINE ISOLATOR

Oakley G. Ross, Paso Robles; Mark L. Kline, Fullerton, and Larry D. Wedertz, Mira Loma, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Nov. 21, 1984, Ser. No. 673,697

Int. Cl.[4] F16L *59/02*

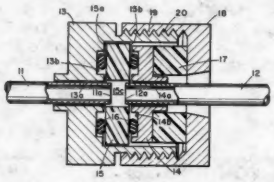
U.S. Cl. 285—50 **8 Claims**

1. A separable isolator suitable for coupling two pieces of conductive tubing carrying high pressure cryogenic gas, which comprises:

two pieces of tubing;

a pair of complementary coupling members, each coupling member being rigidly attached to a corresponding one of the pieces of tubing to define an outwardly-extending annular flange sealed about the periphery of the corresponding piece of tubing in a position facing and slightly set back from an end of the piece, one of the coupling members comprising a hollow socket member and the other coupling member comprising a plug member that fits within the socket member;

a gas-impervious dielectric spacer between the coupling members, the spacer having pair of opposing surfaces



facing the annular flanges and a bore extending therebetween into which the tubing ends extend axially-aligned without contacting each other;

a pair of O-ring seals, each seal in a position about a separate one of the pieces of tubing between one of the annular flanges and the facing spacer surface; and

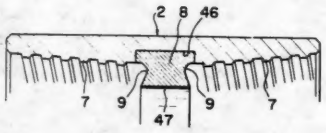
means for releasably and nonconductively connecting the coupling members together to compress the seals between the annular surfaces and spacer surfaces and seal the tubing ends in fluid communication with an electrically-nonconductive gap between them.

4,600,219

CORROSION-RESISTANT PIPE COUPLING STRUCTURES

Toshio Yoshida; Kouyu Itoga, both of Kobe; Shigetomo Matsui, Higashiosaka, and Toshio Atsuta, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Division of Ser. No. 358,801, Mar. 16, 1982, Pat. No. 4,509,776.
This application Jan. 16, 1985, Ser. No. 692,554
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—55 **6 Claims**



1. A corrosion-resistant metal pipe coupling structure comprising:

a tubular metal coupling member including an inner surface and axially opposite ends having internal screw threads for engaging male screw threads provided on axially opposing end parts of two metal pipes to be coupled, the internal surface of each of the pipes having secured thereto an inner metal lining pipe resistant to corrosive fluids; and

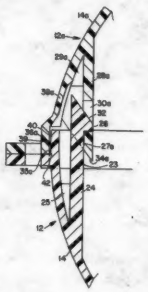
said coupling member including an integral intermediate annular projection extending radially inwardly from said inner surface to be abuttingly engaged by the opposing end parts of the pipes, said annular projection being formed entirely of an annular corrosion-resistant metal member embedded in an annular groove formed in the radially inner surface of said coupling member, said metal member being disposed between and separated from said internal screw threads at said opposite ends of said coupling member, said annular projection including on axially opposite sides thereof undercut portions with which the respective opposing ends parts of the two pipes are in tight sealing engagement.

4,600,220

CONNECTION NUT SEAL WITH MEANS FOR ALLOWING TEST OF INTEGRITY

Frank J. Agnelli, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Nov. 28, 1983, Ser. No. 555,603
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—80 **8 Claims**



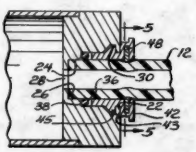
1. A seal comprising a housing formed of two portions having means shaped and dimensioned to nonremovably fasten said portions together, said means comprising a pair of locking members, one member of the pair being on each housing portion, said means allowing a small but appreciable amount of free lateral movement of the housing portions in relation to each other.

4,600,221

CONNECTION SYSTEM FOR FLEXIBLE TUBING

Charles W. Bimba, 9731 Newport Dr., Sun City, Ariz. 85351

Filed Sep. 30, 1985, Ser. No. 781,770
Int. Cl.[4] F16L *55/00*
U.S. Cl. 285—91 **8 Claims**



1. A connector assembly for connecting one end of a plastic tube to a port opening in a device with which the tube is in fluid transport relation, said device including a stepped recessed port opening having an inner opening portion sized to receive a short length of said one end of the tube and an outer opening portion having a larger internal diameter, a sealing O-ring positioned in said outer opening portion, said O-ring being adapted to sealingly engage the inner wall of said outer opening portion and the periphery of the tube at a short distance from its inserted end, a sleeve member having a generally cylindrical inner end portion with inner and outer wall surfaces surrounding a portion of the length of the tube axially outwardly from said O-ring and substantially filling the space between the tube and the inner wall of the outer opening

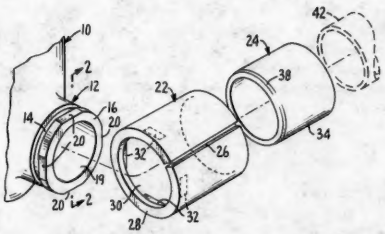
portion, said sleeve member further having an outer end portion which comprises a pair of normally spaced apart leg portions which are joined together at the inner end of said sleeve member and which are integral with said generally cylindrical inner end portion and flexibly movable toward each other at their outer ends in a direction transverse to the axis of said sleeve, said leg portions each having radially outwardly extending projection means intermediate the inner and outer ends of said sleeve, each of said leg portions having a channel-shaped slot therein adjacent its outer end which faces the slot in the other of said leg portions, said slots being in a plane normal to the axis of said sleeve, said device having recess means in the inner wall of said outer opening portion which are complementary to said projection means and are adapted to be engaged by said projections on said leg portions to retain said sleeve and prevent its axial movement relative to said outer opening portion when a length of tubing is mounted in said sleeve, and a bifurcated retaining member having generally parallel elongated leg portions which are adapted to be inserted into the slots in said sleeve and into compressive deforming contact with opposed sides of a length of tubing mounted in said sleeve member, said retaining member being of a size sufficient to engage at least a portion of the bottoms of each of said channel-shaped slots, the engagement of said retaining member with said slots serving to maintain said projection means in engagement with said recess means.

4,600,222

APPARATUS AND METHOD FOR COUPLING POLYMER CONDUITS TO METALLIC BODIES

Donald F. Appling, Lindsay, Calif., assignor to Waterman Industries, Exeter, Calif.

Filed Feb. 13, 1985, Ser. No. 701,307
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—158 **13 Claims**



1. A coupling for securing a polymer pipe in communication with a passage in a metal body, said coupling comprising: a collar secured to the body and opening into the passage, said collar having an external annular groove extending thereabout; a split polymer sleeve received around the collar, said sleeve having an inwardly directed flange engaged with the annular groove of the collar; and an annular insert disposed within the sleeve, said insert being complementally engaged with the sleeve and bonded thereto.

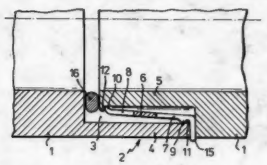
4,600,223

TUBE COUPLING

Robert de Vries, 38 Archimedesstraat, 2517 RW The Hague, Netherlands

Continuation of Ser. No. 420,866, Sep. 21, 1982, abandoned. This application Feb. 1, 1985, Ser. No. 697,336
Int. Cl.[4] F16L *39/00*
U.S. Cl. 285—319 **4 Claims**

1. A tube coupling including two tube sections of substantially equal outer diameter throughout the area at which coupling takes place one end of one of said tube sections inserted into an opposed end of the other tube section, said tube ends comprising a substantially axial recess (3) formed between ends (4,5) of said coupled tube sections (1,1), and a shoulder formed on the outer and inner tube end projecting into said recess, a spring segment sleeve (6) therein, said sleeve including spring segments (7,8) which are outwardly and inwardly somewhat tapered with respect to outer and inner tube ends; the ends (9,10) of said spring segments (7,8) being adapted to lock and abut against said shoulder (11,12) on the outer (4) and the inner



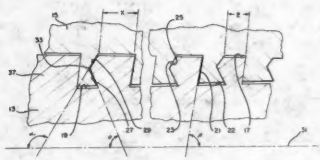
(5), respectively, of the tube ends (4,5) under snap action to hold the tube ends (4,5) together and wherein one of said spring segments bears a flange (15) adapted to be caught between the tube sections and project outwardly therefrom when said tube ends are fixed whereby when said flange is radially pressed inwardly said spring segment which bears the flange is moved away from its abutment against the shoulder so that disconnection of the tube sections (1,1) can be effected.

4,600,224

TUBULAR CONNECTION HAVING A CHEVRON WEDGE THREAD

Thomas L. Blose, Houston, Tex., assignor to Interlock Technologies Corporation, Houston, Tex.

Filed Dec. 23, 1983, Ser. No. 565,051
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—334 **8 Claims**



1. A thread form for a tubular connection of the type having a pin member adapted to be made up with a box member to form a pipe joint, comprising:

a pin member having pin threads with thread crests and thread roots which are adapted to be made up with a mating box member having a complimentary thread structure, said pin thread crests being formed between a stab flank and a load flank of said pin thread;

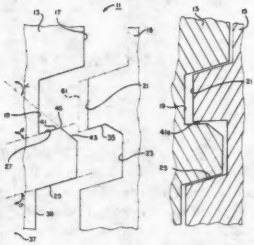
said pin thread having a chevron-shaped load flank made up of an inner wall portion and an intersecting outer wall portion which together form a double sloped flank for engaging a mating chevron-shaped load flank of said complimentary box member to provide a chevron type interfit between the load bearing thread flanks of said pin and box threads, the respective stab flanks of the pin threads and box threads being formed as a single, uniformly sloped flank extending from thread crest to thread root, said chevron type interfit serving to limit the radial movement of said pin threads into said mating box member complimentary thread structure to control the radial make up of said pipe joint; and

wherein said pin and box threads are helically structured as a wedge.

4,600,225
TUBULAR CONNECTION HAVING A PARALLEL CHEVRON THREAD

Thomas L. Blose, Houston, Tex., assignor to Interlock Technologies Corporation, Houston, Tex.

Filed Dec. 23, 1983, Ser. No. 565,119
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] F16L *15/00*
U.S. Cl. 285—334 10 Claims



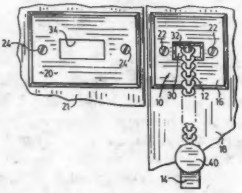
1. A thread form for a tubular connection of the type having a pin member adapted to be made up with a box member to form a pipe joint, comprising:

a pin member having pin threads with thread crests and thread roots, said pin thread crests being formed between a stab flank and a load flank of said pin thread and said pin thread having a chevron-shaped load flank made up of an inner wall portion and an intersecting outer wall portion which together form a double sloped flank, the stab flank of the pin thread being formed as a single, uniformly sloped flank extending from thread crest to thread root.

4,600,226
LOCK WITH ANCHOR MOUNT

Chris R. Christen, 64 Summitcrest Dr., Weston, Ontario, Canada M9P 1H5, and Frank M. Cianfarani, 2757 Battleford Dr., Apt. 15–32, Mississauga, Ontario, Canada L5N 3A8

Filed Oct. 16, 1984, Ser. No. 661,497
Claims priority, application Canada, Oct. 4, 1984, 464787
Int. Cl.[4] E05C *17/36*
U.S. Cl. 292—264 19 Claims



1. A chain-type lock comprising:

a locking chain having a locking bar connected to one end thereof;

a chain holding member having the other end of said locking chain fastened thereto,

first fastener means for mounting said holding member to a door, door jamb or the like, said first fastener means being adapted for insertion through holes formed in said holding member,

a receiver for securing said locking bar in a locked position, said receiver having means for holding said locking bar,

second fastener means for mounting said receiver to a door, door jamb or the like, said second fastener means being adapted for insertion through holes formed in said receiver, and

at least one anchor engageable with said first or said second fastener means in order to hold securely the first or second fastener means in the door, door jamb or the like, said first or second fastener means being receivable in threaded holes formed in said at least one anchor which is adapted for insertion into an opening formed in the door, door jamb or the like, said at least one anchor having an end plate rigidly attached thereto at one end, said end plate providing means for positioning the anchor correctly in said opening.

4,600,227
HAND-HELD FILTER SEPARATING DEVICE

William H. Ennis, 3012 61st Ave. N., Brooklyn Center, Minn. 55429, and Richard M. Ennis, 3107 Woodlawn Ave., Wayzata, Minn. 55391

Filed May 22, 1985, Ser. No. 736,855
Int. Cl.[4] B25J *15/00;* B65H *3/20*
U.S. Cl. 294—1.1 8 Claims

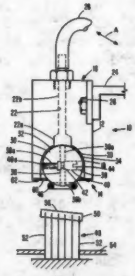
1. A device for overcoming the adherance of one paper coffee filter to another in a nested stack of paper coffee-filters thereby separating that one paper coffee-filter from the nested stack comprising:

a substantially rigid hand-held piece having a hand grip portion and adjacent said hand grip portion a substrate portion having top and bottom surfaces with a layer of pressure sensitive adhesive covering about 0.05 to 0.75 square inches of surface area of both said top and bottom surfaces of said substrate portion, and having sufficient tack to overcome the adherance of one paper coffee-filter to another in a nested stack of paper coffee-filters while having sufficiently low tack that said one paper coffee-filter will not be torn as a result of removal from said adhesive.

4,600,228
LOCKABLE COMPLIANT END EFFECTOR APPARATUS

Robert R. Tarbuck, Ardmore, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed May 31, 1984, Ser. No. 615,628
Int. Cl.[4] B66C *1/02*
U.S. Cl. 294—64.1 3 Claims



1. A lockable compliant end effector apparatus for picking up an associated object comprising:

a main body portion having first and second ends, said body

defining a socket having a first rough spherical surface formed in said first end and a first fluid passageway connecting said socket and said second end of said main body;

means mounted for multi-directional movement to a desired position in said socket, and for being locked in said desired position, said mounted means having a second rough spherical surface adjacent said first rough spherical surface, said spherical surfaces defining an air bearing therebetween, said mounted means having a second fluid passageway formed therethrough, said second passageway having a first end adjacent said first passageway and a second end adjacent said first end of said main body;

means for maintaining said mounted means in said socket and for limiting air flow between said rough surfaces;

a sealing member connected to said mounted means adjacent said second end of said second passageway; and

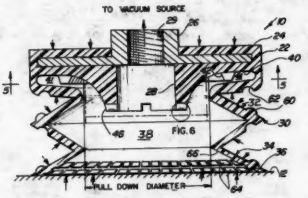
conduit means connected to said main body portion for conducting air in either of a first and second direction through said passageways and through said air bearing, whereby said mounted means is movable to said desired position in response to said air being conducted in said first direction when said sealing member is in proximity with said object, and said mounted means is locked in said desired position in response to said air being conducted in said second direction when said sealing member engages said object and said first rough surface engages said second rough surface.

4,600,229

VACUUM CUP

Peter D. Oten, 1731 Harrow Ct. - No. B, Wheaton, Ill. 60187

Filed Aug. 3, 1984, Ser. No. 637,310
Int. Cl.[4] B66C *1/02*
U.S. Cl. 294—64.1 **7 Claims**



1. A vacuum cup for engaging a workpiece comprising:

a substantially rigid first portion having an inner surface and an outer surface,

a collapsible, resilient convoluted member attached at one end thereof to the periphery of said first portion defining a cavity on which a vacuum is drawn and having a free end for engaging said workpiece,

said convoluted member comprising a plurality of adjacent convolutes attached together in end-to-end relationship,

said adjacent convolutes being in intimate abutting side-by-side relationship when said convoluted member is completely collapsed, and

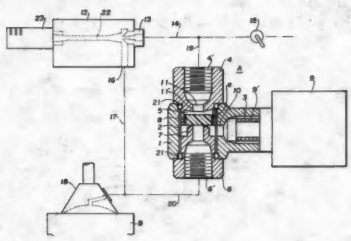
lock means for preventing relative movement between said adjacent convolutes when in said intimate abutting side-by-side relationship.

4,600,230

FLUID FEEDING VALVE AND A VACUUM CHUCK APPARATUS USING SAME

Yoji Ise, Tokyo, Japan, assignor to Myotoku Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,509
Int. Cl.[4] B66C *1/02*; G05D *7/00*
U.S. Cl. 294—64.2 **12 Claims**



1. A vacuum chuck apparatus comprising:

an air ejector pump having a nozzle and a venturi hole in a pump body, said venturi hole being disposed opposedly to said nozzle to define a suction chamber therebetween, said nozzle being connected to a pressurized air line, and said suction chamber being connected to a suction pad means of a chuck device by a vacuum line; and

an air feeding valve comprising a valve body having an axial bore with ports at opposite ends and a valve chamber disposed therebetween, each of said ports being open to said valve chamber through a valve seat, means for connecting said ports to said pressurized air line and said vacuum line respectively, said valve body having another port communicating with said port connected to said vacuum line through said valve seat thereof, said another port also communicating with said valve chamber through a bypath of small sectional area, means for connecting said another port to an air reservoir having suitable volume, and a valve member disposed movably within said valve chamber and movable to one position to open said port connected to said pressurized air line to said reservoir and to close said port connected to said vacuum line so as to charge the pressurized air into said air reservoir while the pressurized air is fed into said pressurized air line to operate said air ejector pump and the negative pressure takes place within said suction pad means, and movable to another position to close said port connected to said pressurized air line and open said port connected to said vacuum line to enable the pressurized air in said air reservoir to be fed into said suction pad means through said vacuum line so as to release the vacuum in said suction pad means, when the feeding of pressurized air through said pressurized air line is stopped.

4,600,231

CARRIER FOR SELF-SUPPORTING SHEET-LIKE ARTICLES SUCH AS PRINTED CIRCUIT BOARDS

Willard J. Sickles, Mill City, Pa., assignor to InterMetro Industries Corp., Wilkes-Barre, Pa.

Filed Jul. 19, 1984, Ser. No. 632,229
Int. Cl.[4] B25H *3/04*
U.S. Cl. 294—161 **7 Claims**

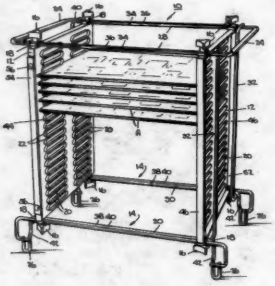
1. A carrier for self-supporting, sheet like, generally planar articles such as printed circuit boards and the like, said carrier being readily disassemblable for storage and assemblable for use and comprising:

first and second independent frames each defining a rigid structure generally lying in one plane, said rigid structure of at least one of said frames defining an opening sufficiently large to permit an article to pass therethrough;

first and second panels each defining a rigid structure lying

generally in one plane and having front and back edges, said panels including support elements for receiving and supporting the edges of articles inserted between said panels in the direction from said front edges toward said back edges thereof; and

means for readily coupling and decoupling said panels to and from said frames with said frames in generally mutually parallel spaced relation and said panels in generally mutually parallel spaced relation, and with the planes defined by said panels extending generally perpendicularly to the



planes defined by said frames, said panels being coupled to said frames by said coupling means such that said support elements are positioned to receive and support edges of articles passed through said opening in said one frame and to position said articles in generally mutually parallel relation with the planes thereof in generally perpendicular relation to the respective planes of both said frames and said panels;

whereby in the assembled condition of said carrier, said frames, said panels, and said articles respectively provide rigidity in three mutually perpendicular planes.

4,600,232

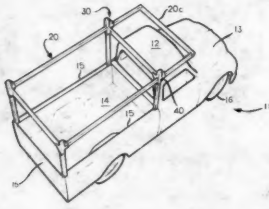
BRACKET KIT

W. Dale Phillips, 2132 Tedrow #89, Toledo, Ohio 43614

Filed Jul. 25, 1984, Ser. No. 634,164

Int. Cl.[4] B60P *3/00*

U.S. Cl. 296—3 **5 Claims**



1. In combination, a pick-up truck, having a rear deck, different lengths of rectangular, cross-sectional tubing defining a rack or frame extending vertically above the margins of the rear deck, and a bracket composed principally of two pieces of die-stamped metal inclusive of formed through-channels of rectangular, cross-sectional configuration adapted to position and hold said tubing and a third piece, comprising a "U" shaped channel secureable to said two pieces and serving as a seat for a transverse length of said tubing forming said rack, and means for securing said bracket pieces and tubing together in secure relationship to define a rigid net work of said tubing to define said rack or frame to thereby enlarge the cargo capacity or cargo carrying capacity of said pick-up truck.

4,600,233

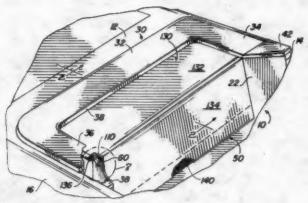
MINI-TONNEAU COVER APPARATUS FOR REAR COMPARTMENT OF CONVERTIBLE VEHICLE

Robert W. Boydston, 156 Lynx Dr., Sedona, Ariz. 86336

Filed Jan. 22, 1985, Ser. No. 693,617

Int. Cl.[4] B60R *7/04*

U.S. Cl. 296—24 R **9 Claims**



1. Cover apparatus for covering a package compartment having a rear wall and side walls and a bottom wall in an automobile, comprising, in combination:

lid means disposed substantially rearwardly of the rear wall;

rod means removably secured to the side walls of the compartment;

cover means disposed over the rod means and dividing the cover means into

a first portion having a bead, said bead disposed over the rear wall and the side walls and the first portion extends from the rod means to the side walls and to the rear wall and is secured by engagement of the lid means and bead to the side walls and to the rear wall, and

a second portion extending from the rod means and downwardly between the side walls to the bottom wall; and

means for securing the second portion of the cover means to the bottom wall.

4,600,234

SUN VISOR FOR MOTOR VEHICLES AND BEARING MEANS THEREFORE

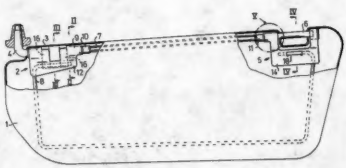
Mats Jönsas, Ljusne, Sweden, assignor to Autopart Sweden Ab, Malung, Sweden

Filed Nov. 6, 1984, Ser. No. 668,985

Claims priority, application Sweden, Nov. 11, 1983, 8306222

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97 K **7 Claims**



1. A sun visor for motor vehicles, including an elongated body comprising moulded compressible material; a main bearing for rotatably mounting a main shaft; and a shaft holder for a second bearing, the main bearing and the holder being embedded in spaced apart relationship in the body material, in the vicinity of one long side of said body, the mutual positions of the main bearing and the holder in the elongatd body being fixed by means of a separate spacer element arranged between said main bearing and said holder and comprising a rigid material, the spacer element (7) being non-rotatably connected to

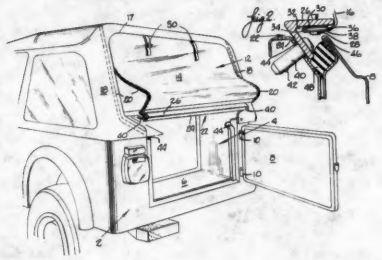
the main bearing and the holder and having the form of a spacer shaft whose central axis coincides with the central axes of the main shaft and the shaft holder and which has end poritons of non-circular cross-section; the main bearing and the holder having bushes of corresponding internal cross-sectional shape, into which said end portions are inserted.

4,600,235

JEEP TOP FASTENING MEANS

Dennis R. Frederick, and Ronald E. Setter, both of Colorado Springs, Colo., assignors to White Automotive Corporation, Colorado Springs, Colo.

Filed Aug. 30, 1984, Ser. No. 646,686
Int. Cl.⁴ B62D *25/06*
U.S. Cl. 296—106 **22 Claims**



1. Apparatus for covering and uncovering an access opening in the rear of an automobile body comprising:

a tailgate for covering and uncovering the lower portion of an access opening in the rear of an automobile body;

a separate flexible member, not connected to said tailgate, for covering and uncovering the remaining portion of said access opening;

said flexible member comprising a flexible pannel having a portion secured to the top and side curtains of said automobile and a rigid elongated member secured to said flexible panel in such a position that a portion of said rigid elongated member lies between said rear of said automobile body and said tailgate when said separate flexible member and said tailgate are in a position covering said access opening; and

means for permitting the movement of said taligate to cover or uncover said lower portion of said access opening without moving any portion of said separate flexible member so that objects may be inserted through said lower portion of said access opening into said automobile body.

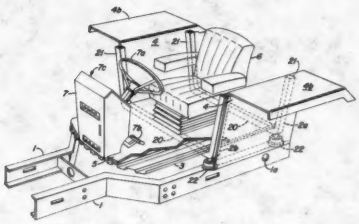
4,600,236

DRIVER STATION FOR A VEHICLE

Heinz Weiss, Bensheim, and Herbert Gelb, Hockenheim, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Jan. 17, 1985, Ser. No. 692,150
Claims priority, application European Pat. Off., Jan. 30, 1984, 84300574.5
Int. Cl.⁴ B62D *33/06*
U.S. Cl. 296—190 **12 Claims**

1. A driver's station adapted to be mounted on a vehicle for supporting a control console and a driver's seat, said station comprising: first and second spaced-apart U-shaped frames, each having a base portion adapted to extend transversely on the vehicle when the station is mounted on the vehicle and first and second upstanding limbs; first and second side panels, the first side panel extending between and secured to the first limbs of the first and second U-shaped frames and the second side panel extending between and secured to the second limbs of the first and second U-shaped frames; and a floor supported on



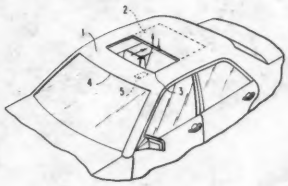
the base portions of the U-shaped frames between the limbs thereof.

4,600,237

SWITCH FOR A SLIDING-LIFTING-ROOF OF A MOTOR VEHICLE

Guntram Huber, Aidlingen; Günter Gmeiner, and Rolf Krü gener, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 29, 1985, Ser. No. 728,030
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1984, 3415997
Int. Cl.⁴ B60J *7/04*
U.S. Cl. 296—223 **25 Claims**



1. A switch structure for an adjustable sliding-lifting-roof of a motor vehicle remotely actuated by an auxiliary force, comprising control means for activating adjusting drive means of the roof for the sliding-roof function by oppositely directed sliding movements and for activating adjusting drive means of the roof for the lifting-roof function by pivot movements, the control means including a single control element for both oppositely directed movements whose visible surface configuration facing an operating person symbolically corresponds approximately to the shapes of the sliding-lifting-roof and which is arranged in a surface flange portion of the switch structure symbolically corresponding approximately to the shapes of the entire vehicle roof as viewed in plan view in such a manner that altogether the vehicle roof with installed sliding-lifting-roof is symbolized thereby.

4,600,238

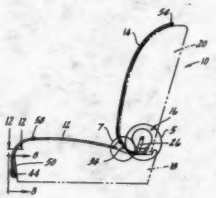
RETRACTABLE SEAT COVER FOR AUTOMOTIVE VEHICLES

Thomas W. Goodford, 34326 Marquette, Westland, Mich. 48185

Filed Jan. 14, 1985, Ser. No. 691,390
Int. Cl.⁴ A47C *31/10*
U.S. Cl. 297—219 **9 Claims**

1. Protective covering for an automotive vehicle seat having a bottom seat cushion and a back seat cushion extending upwardly from the rear edge portion of the bottom seat cushion, comprising a bottom panel for covering the bottom seat cush-

ion, a back panel for covering the back seat cushion, a take-up reel adapted to be mounted near the rear edge portion of said seat, and means for connecting said panels to said reel comprising a web wound upon said reel to which one edge portion of each panel is connected, said panels being connected to said web by a sleeve, one end of said sleeve being connected to said web, the other end of said sleeve having opposed portions



connected respectively to said one edge portion of said bottom panel and said one edge portion of said back panel, said bottom and back panels being adapted to be retracted onto said reel to an inoperative, stored position and to be withdrawn from said reel between the rear edge portion of said bottom seat cushion and said back seat cushion to positions of use respectively covering said bottom and back seat cushions.

4,600,239

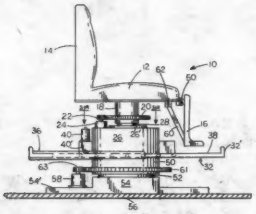
VEHICULAR SEAT FOR HANDICAPPED AND ELDERLY PERSONS

Milton S. Gerstein, Chicago, Ill., and Rosemarie R. Kraft, 4627 S. Talman Ave., Chicago, Ill. 60632, assignors to Rosemarie R. Kraft, Chicago, Ill.

Filed May 6, 1985, Ser. No. 730,494

Int. Cl.[4] B60N *1/04*; A61G *5/00*

U.S. Cl. 297—349 **9 Claims**



1. A vehicular seat for handicapped and elderly persons, comprising, in combination:

a seat proper having a bottom portion;

first means operatively connected to said seat proper for mounting said seat proper for rotation about a first vertical pivot axis; said first means comprising a carriage mounted for reciprocal movement, and also comprising a pivot means upstanding from said carriage rotatably mounting said seat proper for rotation about said first vertical pivot axis;

second means mounting said carriage for reciprocal movement, said second means comprising a horizontal track means; said carriage of said first means having means for guided movement along said said track means so as to define a horizontally-shiftable first vertical pivot axis;

third means for rotatably mounting said track means of said second means for rotation about a second vertical pivot axis; said third means comprising an upstanding pivot shaft defining said second vertical pivot axis, said pivot means being laterally movable relative to said pivot shaft to thereby define an adjustable, eccentric rotation of said seat proper relative to said upstanding pivot shaft, so that said seat proper may be angularly adjusted to the position of the open door of the vehicle, and also be adjusted so that, depending upon its position along said track means, its position relative to the opening of the door of the vehicle may be changed and preset;

said upstanding pivot shaft and said pivot means being substantially in axial co-linear alignment for normal uses of said seat proper when said seat proper is positioned within the vehicle and not projecting outwardly of the vehicular door, so that said pivot shaft and pivot post rotate as one unit without eccentric rotation of said seat proper;

means for selectively and fixedly positioning said seat proper in a desired relative rotational orientation with respect to said track means, whereby said seat proper may be rotated relative to said carriage means and said track means to orient said seat proper at any desired angular position with respect to said track means; and

means for mounting the lower portion of said pivot shaft to the frame of the vehicle to which said seat proper is to be mounted.

4,600,240

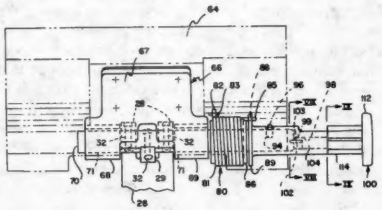
HEADREST CONTROL

Michael J. Suman, Holland; Kim L. Van Order, Hamilton; Russell L. Clark, Zeeland, and Ted W. Haan, Wyoming, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Mar. 9, 1984, Ser. No. 587,988

Int. Cl.[4] A47C *7/36*

U.S. Cl. 297—408 **3 Claims**



1. A vehicle headrest adjustment mechanism including a headrest which is adjustable about a pivot axle, said mechanism comprising:

a spring clutch having a relatively short, large diameter coil spring surrounding an axle about which the headrest pivots said spring having an inner diameter greater than its axial length;

a cylindrical sleeve secured to said axle in axial alignment with said coil spring and extending axially beyond the ends of said spring, said sleeve having an outer diameter slightly greater than the inner diameter of said coil spring and significantly greater than the diameter of said axle to thereby increase the effective clutch working surface;

means engaging said spring for releasing the gripping action of said spring from said sleeve whereby said headrest can be pivoted rearwardly, said headrest being pivotable to a forwardly adjusted position without actuation of said release means;

said release means comprising a second cylindrical sleeve rotatably fitted over an end of said axle and coupled to said coil spring to release the gripping force of said coil spring on said first named sleeve when said second sleeve is rotated in a first direction;

said second sleeve including socket means formed in an end opposite said spring for releasably receiving a control shaft; and

a control shaft with a first end configurated to extend within said socket whereby different lengths of control shafts can be selected for different widths of headrests so as to pro-

vide for the control shaft to extend outwardly beyond an edge of the headrest for access by a user.

4,600,241

CANTILEVER TYPE SEATING UNIT SECURED AT THE BACK

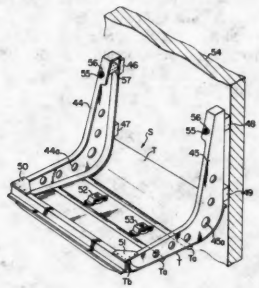
Hideichi Fujii, Kobe; Takehito Miyake, Kasai, and Hiromu Konishi, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha; Yashiro Kako Ltd. and Kawajusanyo Kogyo Co., Ltd., all of, Japan

Continuation of Ser. No. 499,254, May 31, 1983. This application Jul. 18, 1985, Ser. No. 756,561

Claims priority, application Japan, Jun. 3, 1982, 57-94024

Int. Cl.[4] A47C *7/16*

U.S. Cl. 297—457 **2 Claims**



1. A centilever type seating unit with a back that can be secured to a wall surface of a vehicle and the like comprising:

a substantially rigid shell having hook members attached to a rear surface of a back portion at an upper end thereof and fastening members attached to an undersurface of a seat portion at the middle thereof: and

a support frame including a pair of L-shaped support arms of C-shaped cross sections to support said shell along substantially the entire length of its edges, means for securing said arms to a wall surface so as to provide gaps between upper ends of said arms and the wall surface for receiving said hook members over said upper ends, and a seat plate unitarily connected to the L-shaped support arms, said seat plate having fastening seats attached to an upper surface thereof for receiving said fastening members on the undersurface of said seat portion of the shell with the hook members of the shell first hooked to said upper ends of the L-shaped support arms.

4,600,242

METHOD FOR PEAT MINING

Sture Eriksson, Karlstad, Sweden, assignor to Armerad Betong Vägförbättringar Aktiebolag, Stockholm, Sweden

Filed Feb. 6, 1984, Ser. No. 577,008

Claims priority, application Sweden, Feb. 14, 1983, 8300751

Int. Cl.[4] E21C *49/02*

U.S. Cl. 299—7 **2 Claims**

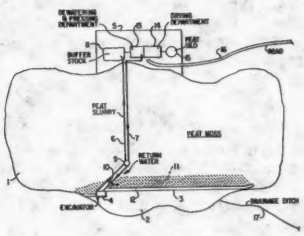
1. A method for mining a peat moss containing peat, having a fine fraction and a coarse fraction, and moss water, having a predetermined temperature, said method comprising:

excavating peat from said peat moss to form a mining pit having a peripheral edge;

mixing said excavated peat with water to form a slurry;

transporting said slurry to a dewatering plant remote from said mining pit wherein said water containing at least a part of said fine fraction of peat is separated from said slurry and heated to a temperature greater than the temperature of said moss water;

transporting said heated water back to said peat moss and spreading at least a portion of said heated water over said peat moss at a sufficient distance from the peripheral edge of said mining pit so that said heated water will penetrate said peat moss and displace said moss water into said mining pit;



whereby said at least a part of said fine fraction is mixed with the upper layers of said peat moss and said heated water will melt frozen peat making frozen peat minable.

4,600,243

HYDRAULIC SERVO BRAKE FOR MOTOR VEHICLES

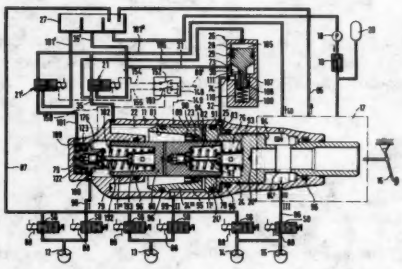
Juan Belart, Walldorf; Jochen Burgdorf, Offenbach-Rumpenheim; Dieter Kircher, Frankfurt am Main, and Lutz Weise, Mainz, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1985, Ser. No. 745,401

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422155

Int. Cl.[4] B60T *8/02, 13/12, 17/18*

U.S. Cl. 303—92 **9 Claims**



1. A hydraulic servo brake for motor vehicles, comprising a pedal-operated tandem master cylinder including two master pistons, wheel brake cylinders connected thereto by way of at least one brake circuit, a brake valve connected between the pedal and the first master piston, which brake valve upon actuation through the brake pedal, applies, in controlled manner, pressure medium supplied by a hydraulic pump connected to an intake reservoir, to the first of said master pistons and, optionally, to a brake circuit directly to provide there a controlled pressure, and comprising a wheel slip brake control system which at the beginning of a slip occuring on one or more motor vehicle wheels, will automatically reduce the brake force on the motor vehicle wheels to a value just sufficient to permit the wheels to turn and which comprises a switch valve to which the controlled pressure is applied equally which switch valve is normally closed and at the beginning of a slip of one or more motor vehicle wheels will open to apply the controlled pressure to the master cylinder from where the pressure medium is passed by way of two check valves to the pressure chambers located behind the master

pistons to which pressure chambers the brake circuits are connected, wherein one switch valve (21, 21') is provided for each pressure chamber (76, 176), with each of such switch valves (21, 21') being connected to the wheel slip brake system by way of a differential pressure control circuit (148) which in response to exceeding a predetermined pressure difference in the two master cylinder pressure chambers (76, 176) indicative of the failure of a brake circuit (I, II) will close the switch valve (21 or 21') of the pressure chamber (76, 176) in which the lower pressure prevails.

4,600,244

AUTOMOTIVE VEHICLE ANTI-BRAKE LOCK SYSTEM

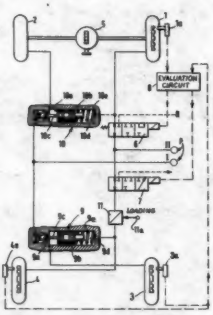
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 23, 1985, Ser. No. 737,155

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419714

Int. Cl.[4] B60T *8/10*

U.S. Cl. 303—111 16 Claims



1. Automotive vehicle wheel anti-lock brake system (ABS) in which two brake circuits (I, II) are provided, acting on first diagonally positioned front and rear wheels (1, 4) and second diagonally positioned front and rear wheels (2, 3) of the vehicle, having

a least one rear speed wheel sensor (3*a*, 4*a*) coupled to at least one (4) wheels (3, 4) of the vehicle and providing a rear wheel speed signal;

a front wheel speed sensor (1*a*, 20) coupled to at least one of the front wheels (1) of the vehicle and providing a front wheel speed signal;

a first magnetic control valve (7, 22, 35) controlling brake fluid pressure at the first rear wheel (4, 4');

a second control valve (9, 9') controlling brake fluid pressure to the second rear wheel (3), coupled to said first, magnetic control valve (7, 22, 35) and forming a first slave control valve, said second control valve controlling brake fluid pressure in the second rear wheel (3) as a function of the operation of the first, and magnetic control valve;

and a speed signal processing and control signal generating circuit (8) receiving the wheel speed signals and providing output signals for controlling the first magnetic brake control valve (7, 22, 35) in dependence on the rotational behavior of the wheels, as sensed by said wheel speed signal sensors and provided to said signal processing and control signal generating circuit (8), said system comprising, in accordance with the invention,

a third, and magnetic control valve (6, 21) controlling brake fluid pressure at the first front wheel (1), connected to and controlled by the speed signal processing and control signal generating circuit (8) and responding upon a tendency of said front wheel to lock;

and a fourth control valve (10,32) controlling brake fluid pressure at the second front wheel (2) coupled to said third, and magnetic control valve (6) and forming a second slave control valve,

said fourth control valve forming the second slave valve controlling brake fluid pressure in a brake associated with the second front wheel (2) to a level which differs from the brake pressure applied to the first front wheel (1).

4,600,245

LIQUID PRESSURE CONTROL DEVICE FOR ANTI-LOCK BRAKE SYSTEM

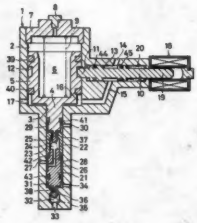
Mamoru Watanabe, Tokyo, Japan, assignor to Watanabe Engineering Kabushikigaisha, Tokyo, Japan

Filed Apr. 10, 1985, Ser. No. 721,587

Claims priority, application Japan, Apr. 16, 1984, 59-76314

Int. Cl.[4] B60T *8/06*

U.S. Cl. 303—115 8 Claims



1. A liquid pressure control device for an anti-lock brake system, comprising:

(a) control valve means intermittently interrupting the liquid pressure feed from master cylinder means to wheel cylinder means;

(b) a liquid pressure control piston which shifts to control the liquid pressure to the said wheel cylinder means;

(c) a differential pressure-responding member which causes the closing action of the said control valve means and the movement of the said liquid pressure control piston, in response to forward motion of the differential pressure-responding member;

(d) a gas pressure chamber charged with gas which returns the said differential pressure-responding member to its initial position during the non-braking and normal braking condition;

(e) a liquid chamber, wherein the controlling liquid pressure acts against the gas pressure in the said gas pressure chamber during the anti-lock action, so as to make the said differential pressure-responding member move forwards;

(f) on-off valve means which inputs the controlling liquid pressure into the liquid chamber during the anti-lock action and dissipates the controlling liquid pressure in the liquid chamber during the non-braking and normal braking condition;

(g) a stopper arranged engageably to the said differential pressure-responding member located in its initial position; and

(h) engagement control means, which maintains the differential pressure-responding member in its initial position by causing the stopper to engage with the differential pressure-responding member during non-braking and normal braking condition and disengages the stopper from the differential pressure-responding member during anti-lock action so as to allow the latter to have forward motion.

4,600,246

TREAD PLATE WITH GROUSERS HAVING CURVED REGIONS

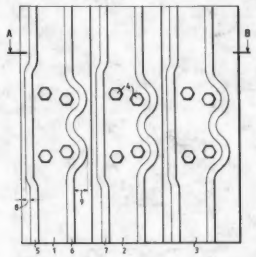
Helmut Bentz, Dortmund, Fed. Rep. of Germany, assignor to O&K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,638

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3246315

Int. Cl.[4] B62D *55/28*

U.S. Cl. 305—54 1 Claim



1. In tread plates each having two grousers for chain-driven vehicles, the tread plates adapted to be bolted to a carrier chain by bolted connections forming a continuous chain which is movable so that the tread plates have positions of linear chain travel and curvilinear chain travel, the improvement wherein

said two grousers are formed only in a region of the bolted connections with radii of curvature and in a region adjacent lateral edges of the tread plates with parallel lateral linear regions and with the distance between said two grousers of each said plate at said lateral linear regions being approximately equal to the distance between adjacent of said grousers of two adjacent of said plates respectively, in the position of linear chain travel, said parallel lateral linear regions extending perpendicularly to a direction of travel of the chain, and wherein

with respect to a line between said two grousers of each said plate, said two grousers of each said plate are asymmetrical in said region of said bolted connections to said carrier chain,

said radii form bulges having bulge deviations, said bulge deviations, respectively, of said each of said two grousers of each said tread plate differ by at least a factor of six in said region of said bolted connections to said carrier chain,

each said plate has only two of said grousers,

one of said grousers of each plate has two of said radii of curvature around adjacent of said bolted connections, respectively, forming two central of said bulges between and extending outwardly from said lateral linear regions thereof toward the closest adjacent of said plates,

the other of said grousers forms one central of said bulges between and extending outwardly from said lateral linear regions thereof toward the closest adjacent of said plates,

said one central of bulge of said other grouser has a linear portion extending across, and opposite and laterally beyond said two central bulges of said one grouser, said linear portion is parallel to said parallel lateral linear regions,

each of said two central bulges of said one grouser is adjacent one of said bolted connections, respectively,

said other grouser has a smaller bulge deviation than that of said one grouser of each said plate and is arranged in a portion of said plate so as to be near a chain bolt for said carrier chain when said plate is bolted to said carrier chain,

said parallel linear regions extend from adjacent lateral edges of the tread plates to adjacent said region of said bolted connections.

4,600,247

HOUSING WITH A DUST COVER HAVING A PIVOTED FRONT

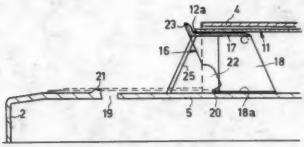
Hermanus F. Einhaus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,040

Claims priority, application Netherlands, Apr. 19, 1983, 8301365

Int. Cl.[4] A47B *81/06*

U.S. Cl. 312—8 14 Claims



1. The combination of a housing having opposed side walls, a bottom wall and an open upper side at a front portion of the housing between said side walls, and a dust cover slidable rearward from an open position to a closed position for closing said upper side, wherein

said dust cover comprises a sliding section having a central upper portion and two side portions arranged so as to have an inverted U-shaped cross-section, said side portions adjoining the upper portion and having lower edges slidable on the housing near said side walls; and a pivotal front section connected to said sliding section, and

in said closed position the front section is in an erect position relative to the bottom wall and closes the sliding section at the front; in said open position the sliding section is slid rearward and said front section is pivoted from said erect position such that at least a part of the front section is in a horizontal position substantially parallel to and adjacent said central upper portion,

characterized in that the front section comprises a central front portion and two side portions, arranged to have a U-shaped cross-section, said side portions being slidable on the housing,

said housing has two guide slots formed therein near front corners of the housing, extending substantially parallel to the direction of sliding of the front section, said slots having ends arranged to engage said front section side portions to control the pivotal movement of the front section, and

the cover comprises coupling means for coupling the front section to the sliding section, arranged such that when said central front section is in said horizontal position the front section and sliding section are slidable over a limited distance with respect to each other in the direction of sliding movement of the sliding section, and slide together over at least a part of the sliding movement of the sliding section between the open and closed positions.

4,600,248

MODULAR DESK CONSTRUCTION

David C. Pflieger, Two Rivers, Wis., assignor to Hamilton Industries, Two Rivers, Wis.

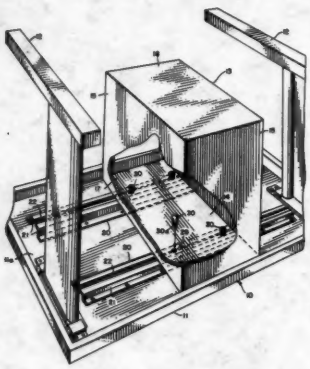
Filed Apr. 25, 1984, Ser. No. 603,645

Int. Cl.[4] A47B *41/02*

U.S. Cl. 312—195 5 Claims

1. A modular desk comprising a generally rectangular top panel; leg means secured to the underside of said top panel for supporting the same upon a floor surface; at least one suspen-

sion track secured to the underside of said top panel between said leg means and extending longitudinally along said top; said track including a pair of side members with inwardly-turned horizontal flanges defining a generally horizontal channel; said flanges of said track having opposing longitudinal edges spaced apart to define an access slot into said channel; a storage or support module having a generally horizontal wall disposed beneath said top panel and having a width measured in the direction of said track substantially less than the length of said track between said leg means; and connecting means for slidably suspending said module from said track and for securely clamping it in any selected position therealong; said means comprising a plurality of connectors each including (a) a



clamping plate with a threaded aperture received in said channel and slidably supported by said flanges and (b) a thumbscrew member having a finger gripping portion, a threaded shank portion, and an enlarged collar portion between said shank and finger gripping portions; each thumbscrew member having its finger gripping and collar portions disposed beneath said wall of said module and its shank portion extending upwardly through an opening in said wall of said module and through said slot of said track into said threaded aperture of one of said clamping plates; whereby, when said thumbscrew members are loosely threaded to said connectors said module is suspended from but may be shifted along said track, and when said thumbscrew members are tightened said wall of said module is securely clamped against the flanges of said track.

4,600,249

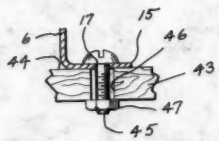
COMPUTER SECURITY CABINET

Terry W. Anderson, Brookfield, Wis., assignor to Omni Tech Corporation, Brookfield, Wis.

Filed Oct. 23, 1984, Ser. No. 663,779

Int. Cl.[4] A47B *37/02, 81/06*

U.S. Cl. 312—196 **12 Claims**



1. A security cabinet for protecting components of a microcomputer at a work station, comprising:

a hollow housing defining a component-receiving cavity, said housing having an open front permitting access to said cavity;

a shelf mounted on said housing within said cavity, said shelf dividing said cavity into upper and lower component-receiving chambers, said shelf is slidably mounted between an inner position within said cavity and outer position projecting from the open front of said housing;

said housing includes a side wall and the slide mounting of said shelf includes a bracket on said side wall defining a first sliding surface thereon, and said shelf includes a corresponding second sliding surface in sliding engagement with said first sliding surface, said shelf includes a channel member running the length of its side that includes said second sliding surface, and said channel member includes an outer leg extending parallel to said side wall, and said side wall includes a guide member defining a channel-receiving groove that slidably receives said outer leg;

a door pivotally mounted on said housing between an open position and a closed position enclosing at least a portion of said open front to prevent removal of components from said cavity and prevent movement of said shelf in said closed position; and

lock means on said door for locking said door in its closed position to said shelf.

4,600,250

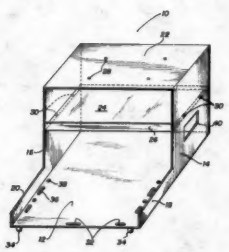
SECURITY STAND

Bob E. Windham, Garland, Tex., assignor to Windham Manufacturing Company, Dallas, Tex.

Filed Dec. 23, 1983, Ser. No. 564,935

Int. Cl.[4] A47B *21/00*; E05G *1/00*; A47G *29/00*

U.S. Cl. 312—208 **2 Claims**



1. A security stand for a computer system including a keyboard, disc drive, and CRT comprising:

a horizontal mounting surface for attachment to a table top, having a plurality of slots and holes for attaching a computer keyboard to the top of the horizontal mounting surface by attachment means inserted through the slots and holes from the bottom of the horizontal mounting surface through to the computer keyboard and which keyboard attachment means are not accessible when the horizontal mounting surface is attached to a table top;

a first side extension, having a width less than the depth of the horizontal mounting surface, connected to and extending vertically from a first edge of the horizontal mounting surface;

a second side extension connected to and extending vertically from a second edge of the horizontal mounting surface parallel to and opposite the first side extension;

a top horizontal surface connected between the remaining ends of the first and second side extensions to form a front and rear open-sided enclosure and to support a CRT attached to the top horizontal surface by attachment means extending through the top horizontal surface from underneath the top horizontal surface;

a separately installed horizontal support attached between the first and second side extensions and beneath the top surface, by attachment means which are not readily unat-

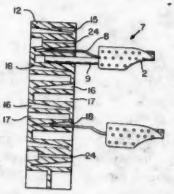
tached, to support one or more disc drives and to prevent access to the CRT attachment means and the rear portion of the keyboard attached to the horizontal mounting surface; and

a lip extending vertically from the front and rear edges of the horizontal support to prevent removal of the disc drives without removing the horizontal support.

4,600,251
DENTAL TRAY RACK

James B. Zimmerman, 11 Lakeshore Plz., Kirkland, Wash. 98033

Filed Jun. 27, 1983, Ser. No. 507,775
Int. Cl.[4] A47B 81/00
U.S. Cl. 312—209 10 Claims



1. A curing rack for supporting a dental impression tray, said tray generally including receptacle means for holding a mass of dental impression molding material therein for forming and setting and means forming at least a first elongated lateral protrusion extending therefrom a substantial distance in a direction generally parallel to the general plane of said receptacle, said rack comprising

a support member having an elongated body of substantial thickness with at least one generally planar external surface,

means for mounting said support member in a rigid upright position with said one external surface extending in a generally vertical direction, and

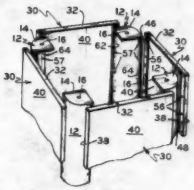
means defining at least one aperture in the body of said support member extending generally horizontally into said one external surface, said aperture having a generally rectangular cross section in a plane parallel and a generally triangular cross section in a plane perpendicular to said one external surface, the cross section at said one external surface being at least large enough to permit unobstructed insertion and withdrawal of said first protrusion, said aperture having an upper surface which slopes downward and backward from one end at said one external surface to a second end interiorly of said support member for engaging an upper free end portion of said first protrusion between the first and second ends of said sloping surface, said sloping upper surface, aperture cross-sections and aperture depth cooperating with said first protrusion for supporting said receptacle means in a cantilevered fashion adjacent and spaced from said one external surface with the general plane of said receptacle means disposed generally horizontally, whereby

a dental impression tray containing unset impression material may be rapidly mounted in said support member by unobstructed linear insertion of the first protrusion into said aperture and engagement between the first protrusion and the aperture surfaces.

4,600,252
MODULAR METAL CABINET

Steven C. Barber, 18900 Highland Ave., Deephaven, Minn. 55391

Filed Feb. 23, 1984, Ser. No. 582,899
Int. Cl.[4] A47B 87/00
U.S. Cl. 312—263 4 Claims



1. A modular metal cabinet having hidden fasteners and comprising,

a plurality of vertical interchangeable upright spatially separated unitary support columns each formed from an upright column section composed of a single piece of sheet metal and consisting of a pair of opposing web portions positioned at right angles to one another at each edge thereof, said web portion defining intersection panel mounting planes and a central quarter round section extending between the web portions and being positioned inwardly from each intersection between the panel mounting planes containing the webs, and each column being oriented with its central quarter round section projecting outwardly,

each cabinet including at least four of said spatially separated columns forming the corners of the cabinet,

the webs of the columns having coplanar pairs of webs defining said mounting planes which extend between the columns,

a plurality of identical interchangeable hollow reinforcing box panels formed from sheet metal comprising stationary side panels,

each box panel is composed of a central wall section of rectangular shape, parallel top and bottom walls extending centrally from upper and lower edges of the central section, parallel vertically disposed side walls extending centrally from side edges of the central wall section, with coplanar tabs extending toward one another from the inward edges of the side walls the tabs of the panels being positioned in said panel mounting planes in abutting face-to-face relationship with the webs of the columns,

said panels thereby projecting outwardly from the panel mounting plane whereby the columns are recessed inwardly from the central wall section of the panels by virtue of the box panels being mounted with said tabs in said mounting planes and said panels projecting outwardly therefrom whereby the central wall, side walls and tabs of the panels intersect to form a rigid structure to protect the columns,

mounting means on the panels and on the columns in which the mounting means comprises a face-to-face abutment of the tabs and underlying outer surface of the web portions of the columns along the edges of the columns and along the inner surface of the tab members for establishing as a sole means of maintaining selected relationship of the panel members and the vertical column members to each other, the web portions and tabs being formed with a like number of vertically spaced openings with fasteners received therein, said fasteners each including portions protruding through the web and the tab to hold the tabs in face-to-face contact with the webs,

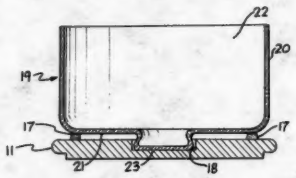
whereby the box structure of the panels connecting the columns to one another strengthens and rigidifies the cabinet and whereby the fasteners are hidden within the box panels.

4,600,253

COMBINATION STORAGE DISPLAY AND SERVING UTENSIL

Phiraphol Pongsengsook, 493 Sampeng St., Bangkok 10100, Thailand

Continuation of Ser. No. 415,136, Sep. 7, 1982, abandoned. This application Feb. 27, 1985, Ser. No. 706,324
Int. Cl.[4] B65D *21/02*
U.S. Cl. 312—284 11 Claims



1. Combination storage, display and serving utensil comprising two mutually invertable coacting components including:

(a) as a first component:

a base having an upper surface and an under surface,

said upper surface being provided with a peripheral edge portion having a retaining portion forming a perimetric marginal reception seat extending around the peripheral edge portion, and

said under surface being provided with a reception recess therein and with support means disposed thereon peripherally outwardly of the recess, and

(b) as a second component:

a bowl-like member having a closed end providing a shoulder, an open end, and a sidewall therebetween,

said sidewall terminating in an open edge at said open end which is fittable around and retentively locatable on the marginal reception seat of the upper surface of the base for coaction therewith to inhibit substantially relative lateral movement therebetween, and

a raised external knob disposed on said closed end and extending outwardly beyond said should in a direction away from said open end,

said knob recess and support means being arranged such that said knob is insertable into and retentively locatable in said recess for coaction therewith to inhibit substantially relative lateral movement therebetween, and such that when said knob is inserted into said recess, said support means are interposed between the under surface of the base and the shoulder of the closed end of the bowl-like member,

whereby a storage and display utensil is provided when said open edge of the sidewall of the bowl-like member is located on said marginal reception seat of the upper surface of the base, and a serving utensil is provided when the two components are mutually inverted and said knob is inserted into said recess in the under surface of the base.

4,600,254

SLIDING DOOR HAVING PINION AND IDLER WHEEL

Robert T. Whalen, Toronto, Canada, assignor to Steelcase Canada Ltd., Markham, Canada

Filed Jul. 18, 1983, Ser. No. 514,989
Int. Cl.[4] E05D *15/58*
U.S. Cl. 312—323 15 Claims

1. A housing having a door structure comprising:

(a) a door,

(b) a pair of elongated tracks one on each side of said door and each mounted on said housing,

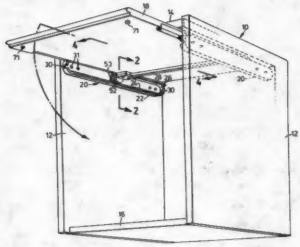
(c) each track having a toothed elongated first surface and a flat longitudinal second surface spaced from and extending parallel to and facing said first surface,

(d) an axle rotatably mounted on said door and having a pair of ends one projecting into each track,

(e) a pinion non-rotatably mounted on each end of said axle,

(f) an idler wheel rotatably mounted on each end of said axle adjacent said pinion,

(g) the spacing between said first and second surfaces and the diameters of said pinions and idler wheels being such that each pinion engages said teeth in its associated first surface and is clear of its associated second surface and each idler wheel contacts its associated second surface and is clear of its associated first surface,



so that as said door is moved back and forth in said housing, said pinion wheels rotate together in engagement with said teeth to keep said door aligned in said cabinet and said idler wheels rotate in a direction opposite to that of said pinions and maintain said pinions in engagement with said teeth,

(h) at least one pinion and its associated idler wheel being slideable laterally along said axle, and

(i) a spacer member removably mounted on said axle for holding such slidable pinion and idler wheel in their associated track,

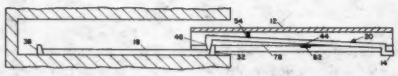
so that said spacer member can be removed and said pinion and idler wheel slid along said axle out of said track to facilitate removal of said door from said housing.

4,600,255

LATCH AND DETENT MECHANISM FOR SLIDING TRAY

Donald L. Dubarko, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 26, 1984, Ser. No. 593,163
Int. Cl.[4] A47B *88/16*
U.S. Cl. 312—333 3 Claims



1. A latch and detent mechanism for a sliding tray situated in a cabinet comprising:

a detent bar fixedly mounted to said cabinet beneath said tray, said detent bar being essentially elongate and having a plurality of linearly disposed, spaced apart detent slots along the length of said detnet bar, said detent bar having a shoulder extending outward from at least one side of the detent bar at each end thereof, and each shoulder having an upwardly extending stop integral therewith;

a latch bar pivotably mounted to the underside of said tray, said latch bar being essentially elongate and being disposed parallel to said detent bar and parallel to the direction of movement of said tray, said latch bar having at one end a finger and a stop on at least one side with said finger disposed to engage said detent slots and said latch bar stop disposed to abut said detent bar stops when said tray is at

its two extreme extents of motion, said finger and stop of said latch bar being spaced apart one from the other;

said detent slots each have four side walls with a first and a second of the side walls disposed transversely to the direction of tray movement, said first and second side walls being inwardly inclined with respect to the top of the detent bar to form a V-shaped slot, and wherein said finger has forward and aft faces that are inwardly inclined by an amount matching the first and second corresponding walls of said V-shaped slot, said forward and aft faces of the finger being disposed to contact said first and second walls of the slot when said finger is engaging one of said detent slots, the incline of the first and second side walls of the detent slots being selected to provide locking of the finger with the detent slot while at the same time allowing the finger to pop out of the detent slot under a force that is less than the shear force of the finger when the tray is struck:

means coupled to said latch bar for pivoting said latch bar to raise said finger from said detent slots for unlocking said tray; and

means coupled between said tray and said latch bar for urging said finger into said detent slots.

4,600,256

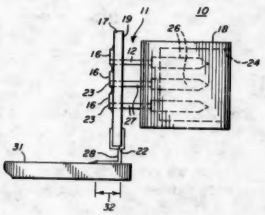
CONDENSED PROFILE ELECTRICAL CONNECTOR

Dennis A. Anttila, Tamarac, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1984, Ser. No. 688,111

Int. Cl.[4] H03H *7/00;* **H01R** *13/46;* **H01G** *9/00*

U.S. Cl. 339—17 M **6 Claims**



1. A condensed profile electrical connector for use in electrically coupling a plurality of conductors to a primary circuit board, said electrical connector comprising:

(a) support means comprising a secondary circuit board for structurally connecting to said plurality of conductors and to said primary circuit board;

(b) first conductor means for electrically connecting to at least some of said plurality of conductors;

(c) second conductor means for electrically connecting at least some of said first conductor means to said primary circuit board;

(d) third conductor means for providing radio frequency shielding with respect to said connector, said third conductor means not being directly electrically coupled with at least some of either of said first and second conductor means, said third conductor means comprising a conductor disposed over a substantial portion of at least one side of said secondary printed circuit board; and

(e) capacitive means for connection between at least some of said first conductor means and said third conductor means.

4,600,257

ELECTRONIC MEMORY DEVICE

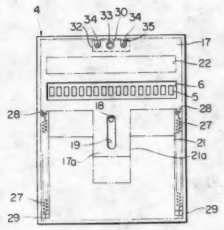
Hideo Fushimoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,150

Claims priority, application Japan, Mar. 8, 1983, 58-36726

Int. Cl.[4] H01R *13/453*

U.S. Cl. 339—40 **8 Claims**



1. An electronic memory device detachably mountable in an electronic apparatus for making electrical connection with connection means in said electronic apparatus, said memory device comprising:

contact means including a plurality of contact elements arranged in a predetermined direction in one plane, said contact elements and said connection means further being arranged to make mutual contact when said memory device is mounted in said apparatus, thereby to establish the electrical connection of said memory device to said electronic apparatus;

plate-like opening and closing means arranged in a second plane adjacent said one plane, respectively for exposing said contact means to the outside of said memory device in an open state thereof and for covering said contact means in a closed state thereof; and

moving means including engagement means for mechanically engaging said apparatus upon mounting of said memory means in said apparatus to cause said-opening and closing means to move in a direction substantially perpendicular to said predetermined direction from said closed state to said open state such that said opening and closing means exposes said contact means; said moving means further including urging means for urging said opening and closing means to move as aforesaid; said urging means and said engagement means lying substantially in at least one of said one plane and said second plane.

4,600,258

SECURITY SOCKET

Andrew Hu, No. 7-3, Lane 58, Po-Ai St., Tan Shuei, Taipei Hsien, Taiwan

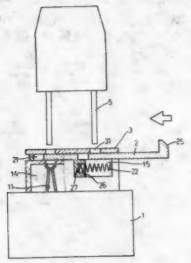
Filed Jul. 23, 1985, Ser. No. 758,069

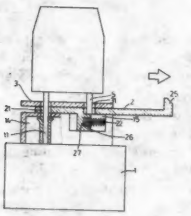
Int. Cl.[4] H01R *13/44*

U.S. Cl. 339—40 **1 Claim**

1. A safety socket mainly comprising a socket, a partition board, a hood and a cover, the socket having a socket body at the middle, the socket body having two receptacles and the hood having two slots for insertion of plug, the socket body having a fixing slot at each lateral side and a spring chamber at one side, the socket having a partition board groove at one side, the hood having two side boards each with a hooked element for hooking the aforesaid fixing slots to secure the hood to the socket body, the partition board being placed in between the hood and the socket body and, having an isolating part in a dimension adapting to the size of the aforesaid hood and socket body, two slots and a column with a chamber being disposed beneath said isolating part, an end of a spring being fixed in the said chamber, and another end of the spring being pushing against an external wall of the spring chamber at the

socket body, the partition board having an end extending towards the partition board groove on which the end is in a form of a block to function as a handle so that by pulling the block in a predetermind way, the slots at the partition board





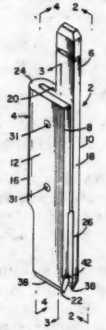
are aligned with the receptacles through compression of the spring and then the socket is ready for insertion of plug, and while the socket is not in use, the slots at the partition board are not aligned with but covering the receptacle to secure safety.

4,600,259

ELECTRICAL TERMINAL HAVING WIRE-RECEIVING SLOT FOR RELATIVELY SMALL DIAMETER WIRES AND CONNECTORS CONTAINING SUCH TERMINALS

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 22, 1985, Ser. No. 704,458
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—99 R **12 Claims**



1. A multicontact electrical connector of the type comprising an insulating housing having a cable-receiving face, a plurality of electrical terminals in the housing, each of the terminals extending beyond the cable-receiving face and having a free end which is spaced from the cable-receiving face, each terminal having a conductor-receiving slot extending inwardly from the free end, the connector being characterized in that:

each of the terminals has a shank portion comprising a folded piece of conductive sheet metal having a bight and first and second flat side-by-side parallel spaced apart plate-like members extending from the bight, the free end being one end of the shank portion, the shank portion having an inner end which is within the housing,

the shank portion having first and second side edges which extend from the inner end to the free end, the bight being on the first side edge and having one bight end which is spaced from the free end, the bight extending from the one bight end towards the inner end,

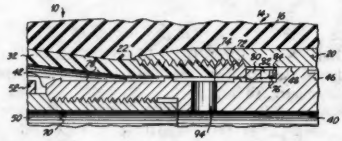
the shank portion having a conductor-receiving section which extends from the free end towards the one bight end, the conductor-receiving slot being the space between the plate-like members in the conductor-receiving section.

4,600,260

ELECTRICAL CONNECTOR

Frank M. Stepniak, Long Valley, and Andrew A. Kominiak, Flanders, both of N.J., assignors to Amerace Corporation, Hackettstown, N.J.

Filed Dec. 28, 1981, Ser. No. 334,587
Int. Cl.[4] H01R *13/52*
U.S. Cl. 339—111 **42 Claims**



1. In an electrical connector of the type in which a contact element assembly is movable within the electrical connector from a first position to a second position to accelerate a first contact element for rapid movement toward engagement with a complementary second contact element brought toward separable engagement with the first contact element within the electrical connector to complete an energized high voltage circuit, the improvement comprising: kinetic energy absorption and dissipation means associated with the electrical connector and constructed for gradually absorbing and dissipating at least a portion of the kinetic energy imparted to the contact element assembly as a result of such acceleration as the contact element assembly moves from the first position toward the second position, the construction of the kinetic energy absorption and dissipation means being such that the absorbed and dissipated portion of the kinetic energy is great enough to subsequently decelerate the contact element assembly sufficiently to facilitate bringing the contact element assembly to a halt subsequent to the engagement of the first and second contact elements.

4,600,261

APPARATUS AND METHOD FOR PROTECTION OF ELECTRICAL CONTACTS

Christian A. M. Debbaut, Alviso, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

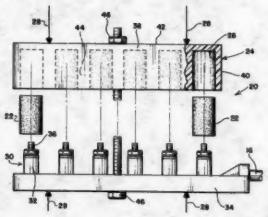
Filed Oct. 12, 1982, Ser. No. 434,011
Int. Cl.[4] H01R *13/52*
U.S. Cl. 339—116 C **19 Claims**

1. A protection apparatus for an electrical contact, comprising:

(a) an insulating gel characterized by:

(1) a cone penetration value from approximately 150 to 350 (10^{-1} mm);

(2) an ultimate elongation of at least approximately 200%;
(3) a maximum tensile strength of approximately 20 psi;
(4) a cohesive strength greater than its adhesive strength;
(b) first means to contain said gel; and
(c) second means to retain said gel within said first means; and



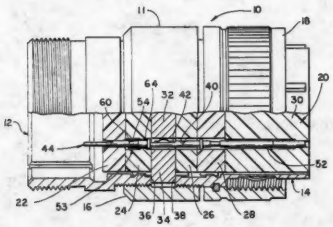
(d) force means which acts on said first means so that said gel is maintained in compressive contact with said electrical contact and substantially encapsulates a conductive portion of said electrical contact, whereby upon release of said force means and a disengagement of said first means from said electrical contact, said gel remains substantially with said first means.

4,600,262

ELECTRICAL CONNECTOR EMBODYING ELECTRICAL CIRCUIT COMPONENTS

Gerald R. Nieman; James E. Thompson, both of Phoenix; William D. Couper, Tempe, and Clarence L. Clyatt, III, Phoenix, all of Ariz., assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Mar. 29, 1983, Ser. No. 480,169
Int. Cl.⁴ H03H *7/00*; H01R *3/00*
U.S. Cl. 339—147 R **24 Claims**



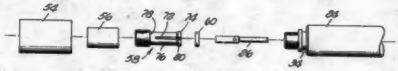
23. An electrical connector member comprising:
an electrical connector shell;
a ground plane extending across said shell and being in electrical contact therewith;
at least one opening in said plane;
a contact mounted through said opening;
a transient signal suppressing diode electrical circuit component mounted on only one side of said contact and carried thereby;
means making releasable electrical connection between said electrical component and said plane; and
contact retention means releasably retaining said contact in said passage whereby said contact with said component mounted thereon may be removed from said shell without disassembly of the connector member.

4,600,263

COAXIAL CONNECTOR

David W. DeChamp, and Clarence L. Clyatt, III, both of Phoenix, Ariz., assignors to ITT Corporation, New York, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,462
Int. Cl.⁴ H01R *17/18*
U.S. Cl. 339—177 R **13 Claims**



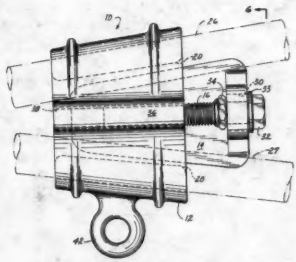
1. An electrical connector member particularly suited for use with a coaxial cable having a center conductor and an outer conductor separated by a relatively soft inner dielectric core comprising:
a conductive shell having a forward mating end and a rear termination end adapted to be connected to the outer conductor of the cable, said rear termination end having a bore therethrough and a rear annual surface;
an insulator in said shell containing a center contact adapted to be connected to the center conductor of the cable;
a hollow bushing having a front, a rear, a forward portion and a rear portion, said bushing being partially inserted into said bore from the rear of said sheel leaving said rear portion exposed, the outer conductor of the cable being adapted to be laid over said rear portion of said bushing;
said bore of said shell having an annular recess;
said rear portion of said bushing having a forward facing annular shoulder abutting said rear surface of said shell, and said forward end of said bushing having a radially deflectable flange engaging said annular recess thereby providing a positive interlock between said bushing and said shell; and
a sleeve surrounding said rear portion of said bushing adapted to be crimped to secure the cable outer conductor to said bushing.

4,600,264

ELECTRIC TAP CONNECTOR

Eugene F. Counsel, Clearwater, Fla., assignor to UTM Power Products, Inc., Tampa, Fla.

Filed Jan. 16, 1985, Ser. No. 691,915
Int. Cl.⁴ H01R *13/24*
U.S. Cl. 339—247 **4 Claims**



1. In a connector assembly for electrically and mechanically joining main and tap conductors, wherein there is a housing body presenting opposed generally arcuate angularly converging line receiving hook portions defining nest areas, said hook portions facing one another and bisected by a common center line plane, and a wedge block positioned within said housing body, the wedge block complementarily configured with the angularly converging line receiving nest areas for tightly

wedging main and tap conductors into the housing body, the improvement comprising:

body surfaces defining a threaded receiving bore having a longitudinal axis lying laterally of said centerline plane and lying in a plane which is perpendicular to said centerline plane at a center line of said body;

a screw drive threadably interconnected to said threaded bore;

a floating interface interconnection between the screw drive and the wedge block, said interface interconnection characterized by a lateral lug portion on said wedge block, said lug portion having a lateral slot defined by a major axis transverse of said center line plane and a minor axis, the distance across said slot at the minor axis being about the same as the diameter of the screw drive, the spaced flange members carried by the screw drive, said interface interconnection lug portion and spaced flange members being further characterized by a freedom of the screw drive and lug portion to shift laterally but not longitudinally; and

whereby the wedge block is driven in forward or reverse directions in response to rotational drive of said screw drive, and the wedge is nevertheless free to find its natural bedding relationship to the housing body.

4,600,265

INFRA-RED OPTICAL SYSTEMS

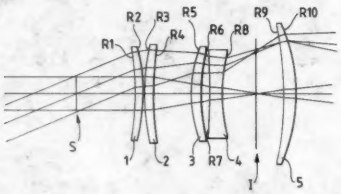
David G. Norrie, St. Asaph, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Jan. 24, 1984, Ser. No. 573,486

Claims priority, application United Kingdom, Jan. 27, 1983, 8302230

Int. Cl.[4] G02B *3/00, 23/00*

U.S. Cl. 350—1.3 **19 Claims**



1. An 'eye-piece' system for a non-Galilean afocal infra-red optical system, the 'eye-piece' system comprising a back lens element or group of positive power, and a front lens group of negative power which contributes towards astigmatism correction, which effects pupil matching, and which overcorrects the Petzval sum, said front lens group comprising a rear lens element with a convex rear surface, a front lens element with a concave front surface, and a biconvex or plano convex gas lens of negative power between the rear and front elements of the front lens group, said concave front surface of said front lens element having a radius of curvature greater than that of said convex rear surface of said rear lens element, and said front lens group spaced from said back lens element by a distance greater than that between said rear and said front elements of said front lens group.

4,600,266

LIGHT BEAM SCANNING APPARATUS WITH A VARIABLE SCANNING WIDTH

Kyoji Omi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 8, 1983, Ser. No. 530,232

Claims priority, application Japan, Sep. 9, 1982, 57-157286

Int. Cl.[4] G02B *26/10*; G03G *15/28*

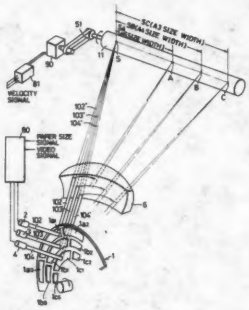
U.S. Cl. 350—3.71 **4 Claims**

1. Apparatus for scanning a light beam comprising:

means for moving an object to be scanned in a first direction;

means for emitting a light beam;

means for periodically deflecting said light beam from said means for emitting thereby causing said light beam to scan said object in a second direction perpendicular to said first direction;



means for setting the scanning width of said light beam in said second direction; and

means for changing the moving speed of said object in relation to the scanning width in said second direction set by said means for setting.

4,600,267

OPTICAL DISTRIBUTOR

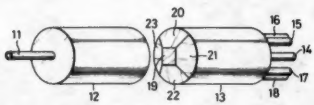
Tetsuya Yamasaki, Amagasaki; Takashi Kishimoto, and Ichirou Yamauchi, both of Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Continuation of Ser. No. 346,754, Feb. 8, 1982, abandoned. This application Jan. 31, 1985, Ser. No. 696,660

Claims priority, application Japan, Feb. 12, 1981, 56-19259

Int. Cl.[4] G02B *6/26, 6/32*

U.S. Cl. 350—96.15 **23 Claims**



1. An optical distributor for transmitting light received from a single first optical fiber to a second optical fiber and to a plurality of third optical fibers, comprising:

first and second graded index type light transmission bodies, the lengths of which are respectively substantially equal to an odd number times ¼ the periodical pitch of light, one end of said first light transmission body being opposed to one end of said second light transmission body so that optical axes thereof may be aligned with each other, and one end of said first optical fiber being opposed to the other end of said first light transmission body so that optical axes thereof may be aligned with each other;

a first surface which is formed at said one end of a selected one of said first and second light transmission bodies and which is substantially perpendicular to the optical axis of said selected light transmission body; and

a plurality of second surfaces which are formed at parts of said one end of said selected light transmission body which are different from said first surface, said second surfaces being inclined at a predetermined angle with respect to said first surface, one end of said second optical fiber being opposed to the other end of said second light transmission body so as to receive light which is transmitted from said first surface, and one end of each of said

plurality of third optical fibers being opposed to predetermined portions, respectively, of said second light transmission body so as to receive graded index type light which is transmitted from said second surfaces.

4,600,268

CABLE FOR TELECOMMUNICATIONS PURPOSES AND A METHOD OF MANUFACTURING THE SAME

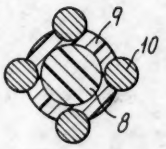
Lyndon R. Spicer, Newport, Wales, assignor to Standard Telephones and Cables Public Limited Co., London, England

Filed Dec. 6, 1983, Ser. No. 558,577

Claims priority, application United Kingdom, Dec. 15, 1982, 8235740

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **6 Claims**



1. A method of manufacturing a cable for telecommunications purposes including providing a composite central string member having a relatively hard inner strength member filament with a relatively soft outer layer thereon and pressing a plurality of conductors thereagainst whereby to at least partially embed the conductors in the outer layer with a predetermined lay while the conductors are spaced apart with respect to one another, and including the step of pulling the composite central string member and the conductors through a die arrangement, which die arrangement serves to progressively guide the conductors towards the composite central string member, whilst maintaining them in the desired configuration relative to one another, and cause the conductors to progressively deform the outer layer of the composite central string member whereby the conductors become partially embedded therein.

4,600,269

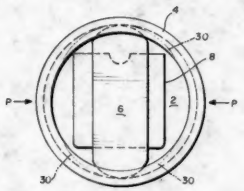
REFLECTING BADGE

Hans A. Rass, 1515 Latham, Rockford, Ill. 61103

Filed Jul. 19, 1983, Ser. No. 515,156

Int. Cl.[4] G02B *5/12*

U.S. Cl. 350—98 **11 Claims**



1. Apparatus comprising,

retroreflective means,

resilient band means surrounding an outer periphery of said retroreflective body means, an inner surface of said resilient band means spaced from said outer periphery when said resilient band means is in a non-deformed state, said resilient band means having a first lip extending from said inner surface to form a first opening for engaging said retroreflective means to secure said resilient band means to said retroreflective means, and retaining means for securing said resilient band means to a flexible material comprising an elongate element having a length greater than a distance between opposed locations of said lip when said resilient band means is in said non-deformed state and less than the distance between said opposed locations when said resilient band means is in a deformed state, whereby said retaining means may be inserted into said resilient band means by deforming said resilient band means and held by said lip when said resilient band means is not deformed.

4,600,270

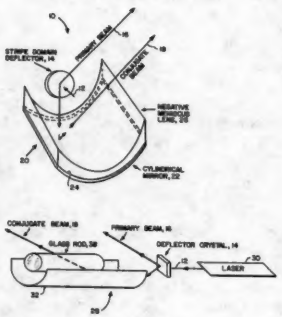
BEAM RECOMBINATION VIA CYLINDRICAL MIRROR

Raymond C. Hedin, Apple Valley; Samuel A. Meddaugh, Eagan, and Ernest J. Torok, Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 25, 1984, Ser. No. 603,795

Int. Cl.[4] G02B *27/44, 3/04*

U.S. Cl. 350—162.17 **8 Claims**



1. A beam recombination device, said beam recombination device comprising:

means for producing a collimated beam;

a diffraction grating, said grating receiving said beam and outputting two first order beams along conjugate axes, one of said first order beams being a primary beam and the other being a conjugate beam; and

means for causing said conjugate beam to be parallel to said primary beam, said means for causing comprising a concave cylindrical mirror and a negative meniscus lens attached to said mirror, said meniscus lens having a concave surface with a radius r_1 defined by the following equation

$$r_1 = R\frac{(n-1)}{n} + t\left(\frac{n-1}{n}\right)^2$$

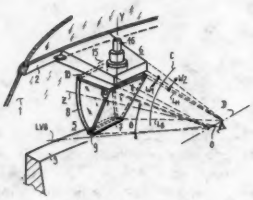
where R is equal to the radius of curvature of said mirror and a convex surface of said meniscus lens in contact with said mirror, t is the thickness of said meniscus lens, and n is the index of refraction of said meniscus lens, a longitudinal axis of said cylindrical mirror being identical with a diffraction grating optical axis being coincident with said collimated beam of said means for producing, said means for causing being located in a lower half of a field of view of said diffraction grating.

4,600,271

HEAD-UP DISPLAY

Claude Boyer, Merignac; Francois H. Gauthier, Boulogne Billancourt, and Jean-Pierre Gerbe, Pessac, all of France, assignors to Thomson CSF, Paris, France

Filed Feb. 29, 1984, Ser. No. 584,909
Claims priority, application France, Mar. 7, 1983, 83 03699
Int. Cl.[4] G02B 27/10
U.S. Cl. 350—174 12 Claims



1. A head-up display which does not limit an observer's field of vision for use in a carrier vehicle comprising:

optical collimation and combination means for displaying display data superimposed on a landscape to an observer;

electronic means for producing said display data to be displayed; and

casing means for supporting said optical means and said electronic means and for attaching to the carrier vehicle;

said optical means including a spherical mirror and a flat mirror which are partly transparent, said mirrors having lower edges which are juxtaposed, and upper edges spaced from one another, the display being mounted in the head-up position;

a bonded thin transparent plate for assembling said juxtaposed lower edges to one another;

connecting means for mechanically connecting said upper edges to said casing means, said connecting means being of a limited thickness to be substantially contained in a plane passing through said upper edges and an optical axis of said optical means at an observation point corresponding to an optical centre of the spherical mirror, said spherical mirror being used on the optical axis, wherein a light ray reflected by said flat mirror toward said spherical mirror is again reflected by said spherical mirror in substantially a same axis as said first reflected light ray, but in an opposite direction

whereby there is no masking effect in the observation field located below said connecting part which connects said upper edges, thereby eliminating any masking effect below the upper edges of said mirrors,

said electronic means being at least partly contained in said casing means whose shape is predetermined so that it is located in a space already masked for the observation of the landscape from said optical centre by the presence of an opaque part belonging to the carrier vehicle.

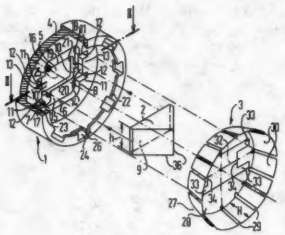
4,600,272

MOUNTING ARRANGEMENT FOR OPTICAL COMPONENTS

Willibald Dost, Munich; Kurt Habenschaden, Eichenau; Hans Kreutzer, and Günter Wasner, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,403
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1984, 3415853
Int. Cl.[4] G02B 7/18, 7/02
U.S. Cl. 350—287 9 Claims

1. A fastening mount for optical elements suitable for use in the path of a light beam, the fastening mount comprising: a cup shaped frame having a cylindrical wall and a bottom at the base of the cylindrical wall, the bottom including an aperture coincident with the path of the light beam wherein the internal side of the bottom has a hollowed out depression adapted to accept the optical element side walls of the depression for securing the optical element in position, a fastening component adapted to be pushed into the frame in the direction of an optical axis corresponding to the path of the light beam, the



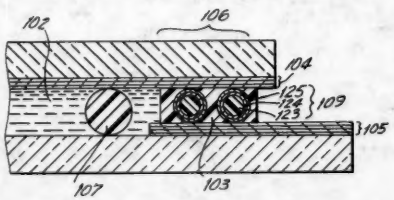
frame having a circular inside-projecting and intermittent peripheral rim located at the top of the cylindrical wall, sheltering an undercut, and the fastening component comprising a U-sectioned spring having a base portion and lateral legs adapted to engage in the undercut and the base portion is peripherally ringed by the lateral legs of the spring to provide a compressional force on the optical element for securing it in the depression.

4,600,273

DISPLAY PANEL HAVING CONDUCTIVE CONTACT MEDIA

Yoshihiro Ohno, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,608
Claims priority, application Japan, Apr. 20, 1982, 57-65698
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—336 15 Claims

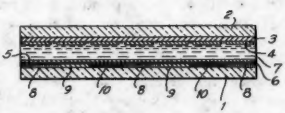


1. A liquid crystal display panel comprising opposed substrates, electrodes on the inside opposed surfaces of said substrates and arranged opposite to each other to define a liquid crystal display layer including a contact portion with a contact media admixed with a binder disposed between the substrates for maintaining the substrates spaced apart and electrically connecting an electrode on one substrate with an electrode on the other substrate, the dimension of said contact media selected to be substantially the same as the thickness of a liquid crystal cell layer, said contact media containing a non-conductive core particle coated with a first conductive layer formed by electroless plating of the core particle and a second conductive layer comprising a precious metal formed on the first conductive layer.

4,600,274
LIQUID CRYSTAL DISPLAY DEVICE HAVING COLOR FILTER TRIADS

Shinji Morozumi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,358
Claims priority, application Japan, Oct. 1, 1982, 57-173513
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 F 37 Claims



1. A liquid crystal display device having a plurality of picture elements arranged in a matrix of columns and rows, comprising:

a first substrate and a second substrate, said substrates facing each other and spaced apart for defining a space therebetween both said substrates being transparent;

a plurality of parallel and spaced apart data lines and substantially orthogonal signal lines insulated from each other and at each intersection a first driving electrode and an associated intermediate component means for coupling said data line to said corresponding first electrode all formed on the surface of said first substrate facing said second substrate;

a plurality of color filters, each associated with an opposed driving electrode and a second common electrode formed on the surface of said second substrate facing said first electrode and said first substrate;

the second common electrode is disposed on the surface of the color filters; and

a liquid crystal material filling the space between said electrodes and retained in said space.

31. A liquid crystal display having a plurality of color picture elements of three primary colors arranged in a matrix of rows and columns, the display having two opposed substrates, the matrix of color filters and a common electrode on one substrate and each picture element having a driving electrode associated with one color filter on the opposed substrate, comprising:

driving circuit means for receiving three primary color signals;

color selection means for selecting sequentially for input each one individually of said three primary color signals and for combining the three color signals on a single line;

element selecting means for selecting said picture elements in sequence, said driving circuit means applying the selected color signals from said single line to driving electrodes of a corresponding color in said selected picture element;

said element selecting means having first inputs for first timing signals for timing said selection of picture elements in sequence for driving, and said color selection means having second inputs for second timing signals for sequentially selecting in synchronism among said three primary color signals, the period of said second timing signals being $\frac{1}{3}$ of the period of said first timing signals, the sequence of color signal selection corresponding to the physical arrangement of colors in said picture element.

34. A liquid crystal display having a plurality of color picture elements of three primary colors arranged in a matrix of rows and columns, the display having two opposed substrates, the matrix of color filters and a common electrode on one substrate and each picture element having a driving electrode associated with one color filter on the opposed substrate, comprising:

driving circuit means for receiving three primary color signals;

color selection means for selecting sequentially for input each one individually of said three primary color signals;

element selecting means for selecting said picture elements in sequence, said driving circuit means applying the selected color signals from said color selection means to driving electrodes of a corresponding color in said selected picture element;

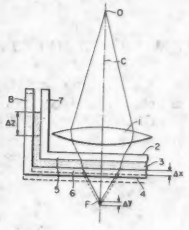
said element selecting means having first inputs for first timing signals for timing said selection of picture elements in sequence for driving, and said color selection means having second inputs for second timing signals for sequentially selecting in synchronism among said three primary color signals, the period of said second timing signals being $\frac{1}{3}$ of the period of said first timing signals, the sequence of color signal selection corresponding to the physical arrangement of colors in said picture element; and

altering means for altering timing of said second timing signals to correspond to the arrangement of colors in each line of said mosaic.

4,600,275
PROJECTION SYSTEM CAPABLE OF EFFECTING PRECISE FOCUS ADJUSTMENT

Kazuo Iizuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,332
Claims priority, application Japan, Oct. 24, 1981, 56-170607
Int. Cl.[4] G02B *3/12, 3/14*
U.S. Cl. 350—418 5 Claims



1. A projection system comprising:

a projection optical system for rendering an object plane and an image plane in conjugate relation;

first and second solid optical means each provided with a planar image-position adjusting portion and disposed between the object plane and the image plane, said first and second optical means being disposed to permit relative movement between said image-position adjusting portions whereby the spacing between said image-position adjusting portions is variable; and

a liquid filling the space between said image-position adjusting portions.

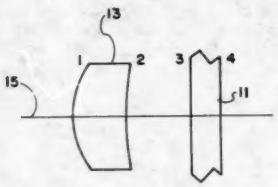
4,600,276
OPTICAL DISC PLAYER LENS

Joseph R. Bietry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 4, 1984, Ser. No. 646,993
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 1 Claim

1. A lens for an optical disc player, the lens comprising a single positive meniscus element having an aspheric convex

surface to be disposed away from the disc and having the following parameters:



SURFACE	RADIUS	THICKNESS
1	Aspheric	2.269 mm
2	47.7003 mm	

the refractive index, N_{800}, of the element is 1.82198 and the Abbé V number is 23.8, with the aspheric surface 1 being defined in accordance with the following relationship:

$$X = \frac{Cy^2}{1 + \sqrt{1 - C^2y^2}} + Dy^4 + Ey^6 + Fy^8$$

with the coefficients having the values:

C=0.2794401
D=−0.1359364×10−3
E=−0.6606383×10−4
F=−0.1056564×10−4

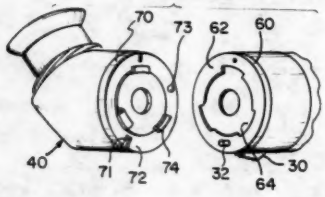
and wherein X is the sag of the aspheric surface from a plane reference surface at a radial distance y from the axis of the lens.

4,600,277

TELESCOPE WITH MULTIPLE IMAGE-VIEWING ASSEMBLIES

Joseph E. Murray, Jr., 27 Alpine St., Malden, Mass. 02148

Filed Feb. 13, 1984, Ser. No. 579,687
Int. Cl.[4] G02B *23/02, 7/02;* F16L *37/24*
U.S. Cl. 350—561 **3 Claims**



1. A telescope system comprising:

A. a main imaging assembly having an objective imaging assembly positioned along a first reference axis for producing an inverted primary image in a first focal plane, an image-erecting lens assembly co-axial with said objective imaging means for producing an erect secondary image in a second focal plane perpendicular to said first reference axis, and a main housing including means for supporting said objective imaging assembly and said image-erecting lens assembly, and

B. at least two image-viewing assemblies and associated means for detachably coupling said image-viewing assemblies to said main housing, each of said image-viewing assemblies having an associated viewing reference axis and including means for providing a user of said telescope system with an erect view of said secondary image along its associated viewing reference axis,

wherein one of said viewing reference axes is an offset viewing reference axis which is offset from said first reference axis by an angle of A degrees and the image-viewing assembly associated with said offset viewing reference axis comprises

an offset viewer housing,

coupling means for detachably connecting said offset viewer housing to said main housing,

an image-converting means for producing an offset image identical to said secondary image in a third focal plane offset by an angle A degrees from said second focal plane, and

a viewing lens assembly positioned to provide viewing of said offset image along said offset viewing reference axis, and

wherein a second of said viewing reference axes is coaxial with said first reference axis, and the image-viewing assembly associated with said second viewing reference axis comprises

a straight-through viewer housing,

coupling means for detachably connecting said straight-through viewer housing to said main housing, and

a viewing lens assembly positioned to provide direct viewing of said secondary image along said first reference axis

further comprising a bayonet coupling means for detachably coupling said main housing to said viewer housing in response to relative rotation of one of said housings with respect to the other of said housings, wherein said bayonet coupling means includes:

A. a receiver plate affixed to said main housing having a substantially planar surface perpendicular to said first reference axis and including at least three notches extending axially therein, and

B. a coupling plate affixed to said viewer housing having a substantially planar surface perpendicular to said first reference axis and adjacent to said planar surface of said receiver plate when said main housing and said viewer housing are coupled, and including at least three flanged tabs extending axially from said coupling plate, each of said tabs being associated with one of said notches,

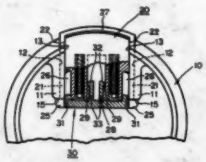
wherein each of said tabs and notches are radially equidistant from said first reference axis when said housings are coupled, and each tab and its associated notch has a first edge equally spaced angularly with respect to the corresponding edges of the other tabs and associated notches around said first reference axis, and at least one of said tabs and associated notches has a different circumferential dimension than the other tabs and associated notches.

4,600,278

LENS CAP

Taizo Saito, Tokyo, Japan, assignor to Ashai Optical Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,453
Claims priority, application Japan, Apr. 20, 1984, 59-58010[U]
Int. Cl.[4] G02B *23/16*
U.S. Cl. 350—587 **3 Claims**



1. In a lens cap having a locking member which is held to the body of the lens cap so as to be movable radially of the body of the cap and is biased in such a direction that it protrudes, retaining portions formed in the body of the cap to prevent the locking member from coming off radially, and engaging legs

formed on the locking member and having anchoring portions which are capable of engaging with the retaining portions, the legs being capable of deforming to positions at which the anchoring portions no longer engage with the retaining portions,

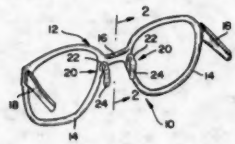
the improvement wherein a spacer is mounted to the locking member so that it occupies the spaces where the engaging legs can resiliently deform to prevent the deformation of the legs after the locking member has been mounted to the body of the cap.

4,600,279

FRAME FOR EYEGLASSES WITH INTERCHANGEABLE NOSE REST MEMBERS

Vittorio Tabacchi, VII Strada n. 20,, 35100 Padua, Italy

Filed Nov. 1, 1982, Ser. No. 438,047
Int. Cl.[4] G02C *5/12*
U.S. Cl. 351—137 **1 Claim**



1. In an eyeglass frame of the type having a front piece formed of two rings arranged alongside each other serving to hold a pair of lenses and a bridge for connecting the inner sides of the two rings together, means for interchangeably connecting different types of nose rest members to the bridge comprising, a pair of substantailly hook shaped stems, each being connected respectively to the inner side of a ring near to the bridge, the stems protruding inward from the frame and comprising a curved base portion of circular cross-section and a flattened portion for connecting the stems to the front piece of the frame and a downwardly extending, inelastically deformable attachment appendage of elongated rectangular shape having a narrowed free end and external holding ridges consisting of retention ridges formed of a plurality of contiguous transverse furrows in the larger surfaces of the attachment appendages for a tongue in groove form-locked fit into interchangeable nose rest members.

4,600,280

DIGITAL AUDIO RECORDING/PLAYBACK SYSTEM FOR MOTION PICTURE FILM

Lloyd D. Clark, 15 Conrad St., San Francisco, Calif. 94131

Filed Jul. 16, 1984, Ser. No. 631,181
Int. Cl.[4] G03B *31/00*
U.S. Cl. 352—37 **6 Claims**

1. In a sound-accompanied photographic medium of the type comprising:

a photographic medium comprising a membrane having a plurality of visible photographic representations of respective successive visible scenes thereon,

said photographic medium having an elongated soundtrack containing a plurality of successive rows of digital bits,

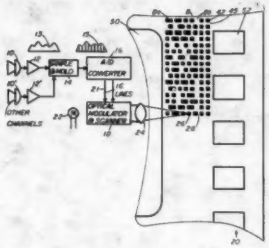
said rows being oriented parallel to each other and perpendicular to the direction of elongation of said elongated soundtrack,

each row containing at least one group of binary bits, each group of binary bits representing a digital binary word,

said bits consisting of substantially dark and substantially transparent areas of uniform size and shape with spaces therebetween,

the groups of bits of successive rows representing successive samples of an analog audio signal, and

means for reading said soundtrack, said means comprising a light source on one side of said membrane and a plurality of groups of photocells on the other side of said membrane, each group of photocells corresponding to a respective one of said binary bits, each group comprising at least two photocells.

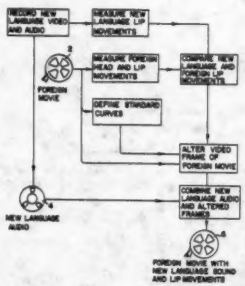


4,600,281

ALTERING FACIAL DISPLAYS IN CINEMATIC WORKS

Richard W. Bloomstein, 1443 Cavell, Highland Park, Ill. 60035

Filed Mar. 29, 1985, Ser. No. 717,843
Int. Cl.[4] G03B *19/18*
U.S. Cl. 352—50 **17 Claims**


RECORD NEW LANGUAGE VIDEO AND AUDIO
MEASURE NEW LANGUAGE LIP MOVEMENTS
MEASURE FOREIGN HEAD AND LIP MOVEMENTS
COMPARE NEW LANGUAGE AND FOREIGN LIP MOVEMENTS
FOREIGN MOVIE
DEFINE STANDARD CURVES
ALTER VIDEO FRAME OF FOREIGN MOVIE
COMBINE NEW LANGUAGE AUDIO AND ALTERED FRAMES
NEW LANGUAGE AUDIO
FOREIGN MOVIE WITH NEW LANGUAGE SOUND AND LIP MOVEMENTS

1. A method of altering a cinematic work by substituting a second animated facial display for a first animated facial display and in which the displays have lip movements corresponding to the languages used and wherein the languages of the two displays are sufficiently different to result in different lip movements for each display, comprising: generating data in digital form representing the configuration of the second facial display over a plurality of cinematic frames, generating data in digital form representing the configuration of the first facial display over a plurality of cinematic frames of said work, and altering under the control of both sets of said data and a programmed digital computer the configuration of said first facial display to produce substantially the configuration of the second facial display.

4,600,282
ALIGNMENT APPARATUS

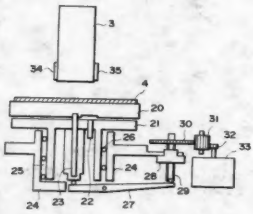
Mitsugu Yamamura, Yokohama, and Minoru Yomoda, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 667,993

Claims priority, application Japan, Nov. 14, 1983, 58-212490; Nov. 18, 1983, 58-215979; Nov. 18, 1983, 58-215981

Int. Cl.[4] G03B *27/34*

U.S. Cl. 353—122 **16 Claims**



1. An apparatus for aligning an object with an imaging plane of an optical system, comprising:

a first detecting means for detecting the position of the object with respect to the imaging plane of the optical system;

displacement means for changing the positional relation of the object relative to the imaging plane of the optical system;

a second detecting means for detecting the amount of change in the positional relation of the object relative to the imaging plane of the optical system by said displacement means; and

control means for controlling said displacement means on the basis of the results of detection by said first and second detecting means, said control means comparing sequentially the results of detection by said first and second detecting means with each other and controlling said displacement means so that the results of detection by said first and second detecting means co-ordinate with each other.

4,600,283
APPARATUS AND METHOD FOR THE AUTOMATIC CONTROL OF AN AERIAL PHOTOGRAPHIC CAMERA

Rainer Görsch; Wolf-Rainer Gräfe, both of Berlin; Hans-Jörg Grundmann, Neustrelitz; Peter Poerschke; Werner Steffen, both of Berlin; Thomas Braunschweig; Rolf-Peter Mark, both of Jena, and Bernard Beck, Jena-Lobeda, all of German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

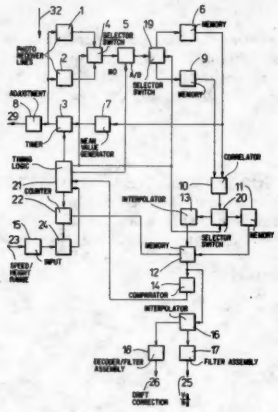
Filed Jul. 17, 1984, Ser. No. 631,280

Claims priority, application German Democratic Rep., Aug. 4, 1983, 253719; Dec. 1, 1983, 257348

Int. Cl.[4] G03B *39/00*; G01P *3/36*

U.S. Cl. 354—66 **3 Claims**

1. Method for controlling an aerial camera wherein first and second photoreceiver lines are disposed parallel to one another and perpendicular to the flight direction of the camera, and a third photoreceiver line is disposed parallel to said flight direction, comprising, in a first cycle, storing the data (measurement values) of the third photoreceiver line lying parallel to the flight direction and storing the data (measurement values) of the first photoreceiver line, which lies in front of the second receiver line in the flight direction; in a second cycle calculating from the data of the third photoreceiver line the shift of the image in the flight direction by correlation; calculating the vg/hg ratio from the shift and sending it to a mechanism for controlling the overlap; comparing the image shift with the distance of the two photoreceiver lines, and when the distance is attained, sending a signal to a first correlator; then, upon receipt of said signal, comparing the stored data of the first photoreceiver line with the actual data of the second line in



said first correlator, determining the drift from the shift, and applying it to a mechanism for drift compensation.

4,600,284
GRIP FOR A CAMERA

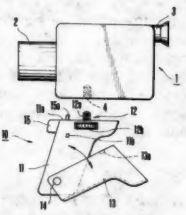
Yuji Kondoh, Tokyo, and Tadahide Fukushima, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,533

Claims priority, application Japan, Jan. 6, 1983, 58-304[U]

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—82 **23 Claims**



1. A camera comprising:

(A) a camera body; and

(B) a foldable grip having:

(B-1) a grip body;

(B-2) attaching means for attaching said grip body to said camera body so that the grip body is pivotable between a folded and an unfolded position relative to the camera body;

(B-3) locking means for locking said grip body relative to said camera body at said unfolded position of the grip body;

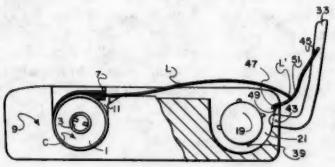
(B-4) manually operable means operable for releasing the locking of said grip body relative to said camera body by said locking means; and

(B-5) covering means attached to said grip body and movable relative thereto for covering and uncovering said manually operable means, said covering means being movable to cover said grip body when said grip body is locked by said locking means at said unfolded position.

4,600,285
OVEREXTENDED LEADER POSITIONING MECHANISM

Frederick W. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,562
Int. Cl.[4] G03B *35/00*
U.S. Cl. 354—212 **8 Claims**



1. In a photographic camera of the type wherein (a) a cartridge receiving chamber is provided in the camera body to receive a film cartridge having a light-trapped slit from which an inherently curled film leader protrudes and (b) a film take-up chamber is provided in the camera body for receiving a leading end portion of the leader to take up the film from the cartridge, the improvement comprising:

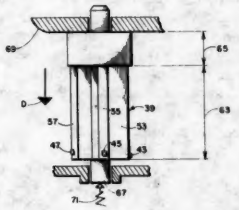
a camera back supported for movement with respect to said camera body to close said cartridge chamber and said take-up chamber; and

positioning means, mounted on said camera back and operating in response to closing movement of the back, for forcing a film leader extended beyond said take-up chamber to bow in the direction of its inherent curl and be inserted leading end portion first into the take-up chamber.

4,600,286
CAMERA WITH FILM TAKE-UP SPOOL

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1985, Ser. No. 701,719
Int. Cl.[4] G03B *1/00*
U.S. Cl. 354—212 **7 Claims**



1. In a camera of the type adapted to receive a filmstrip having a leader, and wherein a rotary take-up spool has engaging means for engaging the leader to wind the filmstrip onto said spool, the improvement comprising:

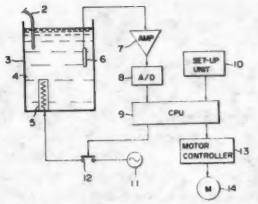
said engaging means including a first engaging member disposed at a location on said take-up spool to engage a film leader properly positioned in relation to the spool, for proper winding of a filmstrip onto said spool, and a plurality of second engaging members disposed at respective locations on said spool to engage a film leader in various improper positions the leader may be located which prevent proper winding of a filmstrip onto the spool; and

means supporting each of said second engaging members for movement in engagement with a film leader in an improper position to situate the leader in the proper position, whereby the filmstrip can be properly wound onto said take-up spool.

4,600,287
METHOD AND DEVICE FOR AUTOMATICALLY DEVELOPING PHOTOSENSITIVE MATERIAL

Tomiji Hotta; Masami Ohtani, both of Kyoto; Yoshihiro Masuda, Shiga; Norimasa Nomura, and Yozi Dohi, both of Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 15, 1983, Ser. No. 504,579
Claims priority, application Japan, Jul. 30, 1982, 57-133302; Mar. 29, 1983, 58-51592
Int. Cl.[4] G03D *3/08*
U.S. Cl. 354—299 **7 Claims**



1. Method for automatically developing photosensitive material, characterized by comprising the steps of:

representing a relationship existing between temperature for photographic developer and a time period of photographic development results in regards to a specific developer and the photosensitive material by a mathematical function obtained experimentally;

adjusting temperature of the photographic developer to a certain reference temperature; and

controlling the time period of photographic development according to the actual temperature of the photographic developer detected by a sensor, said time period being adjusted by changing speed of a conveyor for the photosensitive material in a developing tank; thereby, for time periods when said photographic developer exceeds the reference temperature and even in the course of said photographic developer being heated to attain the reference temperature, the photosensitive material be can processed to obtain acceptable development results.

4,600,288
CAMERA PROVIDED WITH A DEVICE FOR GENERATING A SIGNAL REPRESENTATIVE OF THE FINISHED STATE OF THE EXPOSURE

Ryoichi Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1981, Ser. No. 279,222
Claims priority, application Japan, Jul. 2, 1980, 55-90874
Int. Cl.[4] G03B *7/087, 7/099*
U.S. Cl. 354—435 **2 Claims**

1. A camera comprising:

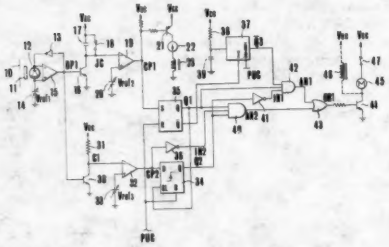
a shutter having blades functioning as aperture setting blades, and disposed in the photographic optical path of the camera;

an auxiliary diaphragm being operatively engaged with the movement of said aperture setting blades;

a light measuring circuit having a light measuring element disposed at said auxiliary diaphragm so as to measure a light from an object to be photographed through the auxiliary diaphragm;

said auxiliary diaphragm being in an open state for performing a pre-measurement of the light from the object before a shutter release, and becoming a closed state immediately

after the start of shutter action and becoming an open state in accordance with a shutter opening for performing an exposure measurement and being closed in accordance with a shutter closing, said light measuring circuit measuring the light from the object through said auxiliary diaphragm for an exposure when the shutter is opened;



means for generating a shutter-close order signal for closing said shutter in response to an output of said light measuring circuit; and

a detector circuit for detecting an output variation of said light measuring circuit caused by closing of said auxiliary diaphragm after said shutter-close order signal is generated and for generating a signal representative of the finished state of the exposure.

4,600,289

APERTURE CONTROL SYSTEM FOR CAMERAS

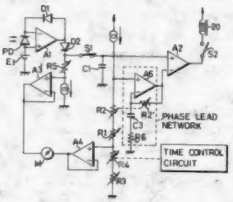
Osamu Maida, Tokyo, and Akira Katayama, Koganei, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,246

Claims priority, application Japan, Sep. 19, 1983, 58-172560

Int. Cl.[4] G03B *7/085, 7/20*

U.S. Cl. 354—448 **4 Claims**



1. A camera of such a type that it controls an aperture drive mechanism in an objective lens to change the opening of an aperture until it reaches a predetermined aperture value, said camera comprising:

(a) displacement means displaceable in association with said aperture drive mechanism to change said aperture opening;

(b) means producing a monitoring output corresponding to the change of said aperture opening;

(c) signal means provided on said objective lens and showing the characteristics of said objective lens concerning the speed of said aperture opening change when said displacement means is caused to be shifted by said aperture drive mechanism;

(d) electric circuit means producing an electric output in response to said monitoring output; and

(e) latch means including electromagnetic means responsive to said electric output and effective to stop the motion of said displacement means in response to said electromagnetic means;

(f) said electric circuit means being adapted to produce said electric output earlier by a time period corresponding to time delay from the enabling of said electromagnetic means to the stoppage of said displacement means than the time in which said aperture opening is changed to said predetermined aperture value by said displacement means, and having means for regulating the timing at which said electric output is produced based on said signal means, said regulating means including phase lead circuit means receiving as input said monitoring output, the phase lead circuit means producing an output added to the monitoring output by a predetermined amount following said signal means when said monitoring output changes.

4,600,290

MAGNETIC BRUSH/STATIONARY ELECTRODE DEVELOPMENT SYSTEM

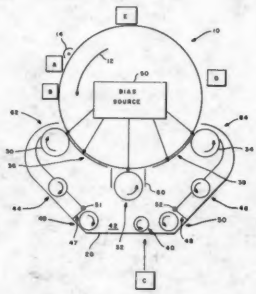
Steven R. Ungemach, Pleasanton, Calif., assignor to Ricoh Co., Ltd., Tokyo, Japan and Ricoh Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 593,486, Mar. 26, 1984, abandoned.

This application Jul. 15, 1985, Ser. No. 754,914

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **8 Claims**



1. In an electrophotographic copying apparatus for developing electrostatic latent images on a photosensitive outer surface of a rotating developing drum, the drum being moved through a development zone in contact with a cascading flow of two-component developer material to develop the latent electrostatic image, the apparatus including:

(a) a sump containing a supply of developing material including electrically charged toner particles displaying the opposite electrostatic polarity of said image,

(b) a first cylindrical electrode supported for rotation in the direction of movement of said surface;

(c) a first bias supply for forming a brush on the surface of said electrode for developing said image, said first electrode being located close enough to the surface of the drum to brush the surface and thereby develop said images,

(d) a second cylindrical electrode supported for rotation opposite the direction of movement of said surface,

(e) a second bias supply means for forming a brush of toner material on the surface of said second electrode for developing the images, said second electrode being located sufficiently close to said surface of said drum to brush the surface and develop the trailing edges of said images,

(f) a plate electrode extending parallel to said drum between said first and second electrodes,

(g) a third bias supply for biasing said plate electrode to supplement the development of said images, and

(h) means for directing a supply of toner material over said first cylindrical electrode and along a path between said

plate electrode and said drum to develop said latent images.

4,600,291

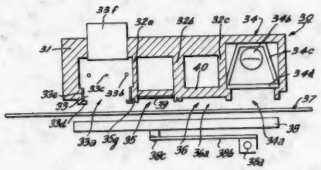
ELECTRO-PHOTOGRAPHIC DEVICE WITH A PROCESSING HEAD HAVING MULTIPLE CHAMBERS

Shuichi Ohtsuka; Akira Yoda; Akinori Kimura, and Isoji Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1984, Ser. No. 578,522

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **9 Claims**



1. An electro-photographic device having a processing head for forming picture images on an electro-photosensitive material, said processing head comprising, as an integral unit, a housing having four processing chambers including a charging chamber which also serves as an exposing chamber, a developing chamber, a drying chamber and a fixing chamber, each of said processing chambers having an opening abutting a plane in which electro-photosensitive material passes said processing head, said openings being arranged in the following order: charging chamber opening, developing chamber opening, drying chamber opening, and fixing chamber opening in the direction of movement of the electro-photosensitive material, the openings being spaced apart at intervals corresponding to the length of a frame of a picture image formed on the electro-photosensitive material; said charging chamber having charging means for charging a prescribed area of the electro-photosensitive material abutting said charging chamber opening, said charging chamber opening being positioned in an optical path of a picture image light for exposing the electro-photosensitive material, said path passing through said charging chamber, so that electro-photosensitive material abutting on said charging chamber is exposed to said picture image light to form a static latent image on a surface layer of the exposed electro-photosensitive material; said developing chamber being constructed such that an interval is formed as its opening abuts against the surface layer with the static latent image, for developing the static latent image by supplying a developer into said interval; said developing chamber having an outer periphery with a suction slit facing the electro-photosensitive material, for removing leaking developer by negative pressure; said drying chamber being constructed such that drying air is applied to the electrophotosensitive material to dry the developer; and said fixing chamber comprising a fixing means for fixing a toner picture image formed on the electro-photosensitive material.

4,600,292

PHOTOCONDUCTIVE SCREEN

Yoshihide Fujimaki; Masataka Takimoto, and Hiroyuki Nomori, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,638

Claims priority, application Japan, Apr. 7, 1983, 58-61191; Apr. 7, 1983, 58-61192

Int. Cl.[4] G03G *17/00, 15/00*

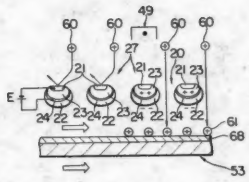
U.S. Cl. 355—3 SC **16 Claims**

1. A photoconductive screen, comprising:

a conductive screen substrate with many perforations therein, said conductive screen substrate being a seamless and endless rotatable loop;

an insulating layer formed substantially on one side of said screen substrate; the surface of said screen substrate on said one side thereof not having any adjacent surface portions defining an angle of 90° or less therebetween;

a biasing conductive layer substantially covering said insulated layer and formed substantially only on said one side of said



screen substrate without contacting the opposite side of said screen substrate so as not to short-circuit to said screen substrate; and

a photoconductive layer substantially covering said conductive layer;

wherein an electrostatic image can be formed on said photoconductive screen so as to control a flow of charged particles for formation of an electrostatic latent image on a chargeable layer thereof.

4,600,293

PHOTOCOPYING APPARATUS AND METHOD WHEREIN THE OPTICAL SCANNER ACTS AS AN ALIGNMENT GUIDE

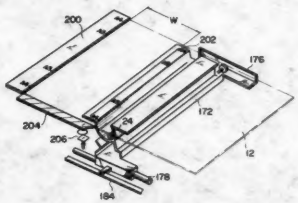
Junji Watanabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 30, 1984, Ser. No. 595,356

Claims priority, application Japan, Mar. 30, 1983, 58-54306; Mar. 30, 1983, 58-54307

Int. Cl.[4] G03G *15/28*

U.S. Cl. 355—8 **12 Claims**



1. An apparatus for photocopying a document including:

means for selecting a first dimension of an image to be copied;

document table means for supporting a document bearing an image to be copied, said table means including means defining a first alignment guide;

optical scanning means, movably disposed under said document table means, for optically scanning said document to form an optical image thereof;

scanner moving means, operatively coupled to said scanning means, for moving said scanning means to an initial resting position located a distance from said first alignment guide equal to said dimension selected by said selecting means, and for thereafter moving said optical scanning means between said initial position and the position of said first alignment guide so as to optically scan said document; and

second alignment guide means, disposed on said optical scanning means and visible through said document table means, for permitting said document to be aligned between the initial position of said scanning means and the position of said first alignment guide.

4,600,294

IMAGE FORMING APPARATUS WITH DETECTOR AND CONTROL

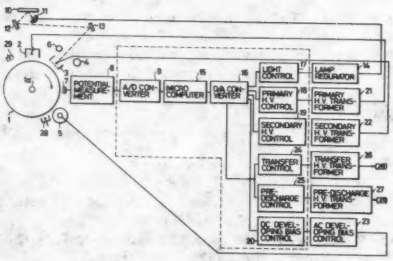
Koji Suzuki; Jyoji Nagahira, both of Yokohama; Kazuyoshi Takahashi, Kawasaki; Kunio Yoshihara, Tokyo; Toshiro Matsui, Kawasaki, and Tadashi Ishikawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,545

Claims priority, application Japan, Apr. 1, 1983, 58-55151; Apr. 1, 1983, 58-55152; Apr. 1, 1983, 58-55153; Apr. 1, 1983, 58-55154; Apr. 1, 1983, 58-55155; Apr. 1, 1983, 58-55156

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—14 D **24 Claims**



1. An image forming apparatus comprising:

(a) image forming means adapted for image formation on a recording member and comprising latent image forming means for latent image formation on said recording member and developing means for developing said latent image with a developer;

(b) detecting means for detecting the surface status of the non-image area on said recording member; and

(c) control means for controlling an operational condition of said developing means for said non-image area in accordance with the detection result by said detecting means so as to prevent deposition of said developer onto said non-image area.

4,600,295

IMAGE FORMING APPARATUS

Koji Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,918

Claims priority, application Japan, Nov. 30, 1983, 58-224459; Nov. 30, 1983, 58-224460; Nov. 30, 1983, 58-224461

Int. Cl.⁴ G03G *15/06*

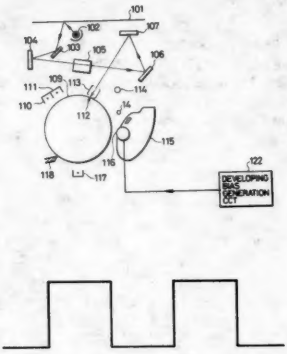
U.S. Cl. 355—14 D **23 Claims**

1. An image forming apparatus comprising:

image forming means for forming an image on a recording member;

wherein said image forming means comprises latent image forming means for forming an electrostatic latent image on said recording member and developing means for recording said electrostatic latent image visible;

bias voltage generating means for supplying said developing means with a bias voltage having a square wave form; and



setting means for setting, in variable manner, duty ratio of said square wave.

4,600,296

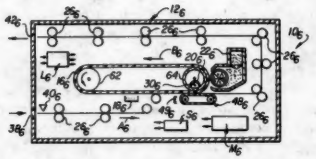
COMPACT ELECTROGRAPHIC REPRODUCTION APPARATUS

Charles T. Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,455

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—16 **10 Claims**



1. A compact electrographic apparatus, said apparatus comprising:

a photoconductive member movable about a closed loop path;

electrographic process means, located relative to such path, for (1) uniformly charging said photoconductive member, (2) exposing information from a source document onto the photoconductive member to form an electrostatic charge pattern corresponding to such information, (3) developing such charge pattern, (4) transferring the developed pattern to a receiver member, (5) fixing the transferred pattern to such receiver member, and (6) cleaning the photoconductive member for reuse,

means for sequentially transporting a source document and a receiver member selectively along a common path associated with said electrographic process means and said photoconductive member; and

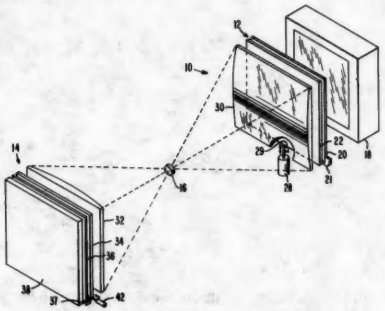
means for controlling said electrographic process means to reproduce information from a source document on a receiver member.

4,600,297

APPARATUS AND METHOD OF PROJECTION PRINTING OF THREE-DIMENSIONAL PHOTOGRAPHS

Douglas F. Winnek, 80 Laurel Dr., Carmel Valley, Calif. 93924

Filed Jun. 1, 1983, Ser. No. 500,109
Int. Cl.[4] G03B *27/32, 35/14*
U.S. Cl. 355—22 12 Claims



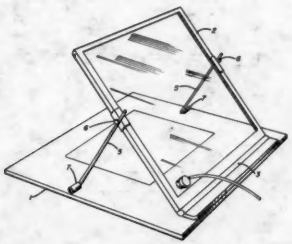
1. A projection system for making three dimensional photographs comprising: means at a first location for mounting a first film having images representing a succession of aspect views of a subject thereon, said images adapted to be printed on a print film; second means at a second location on the opposite side of said projection lens for mounting a second film adapted to receive images projected from the first film; a projection lens between the first and second locations and in optical alignment with the first mounting means and the second mounting means; first lattice means adjacent to the first film mounting means for causing the light images to be projected from the first film at the first location corresponding to the series of aspect views of the images on the first film; first drive means for moving the first lattice means and the first film mounting means relative to each other through a distance of one pitch line of the lattice means; a second lattice means between the projection lens and the second film mounting means for dividing the images projected through said projection lens into a succession of aspect views to be directed onto the second film at the second mounting means; and second drive means at the second location for moving the second lattice means and the second film mounting means relative to each other.

4,600,298

PIVOTAL LOCKING ARM FOR PHOTOTOOL ASSEMBLY

Richard L. Emmert, New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1984, Ser. No. 585,081
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 13 Claims



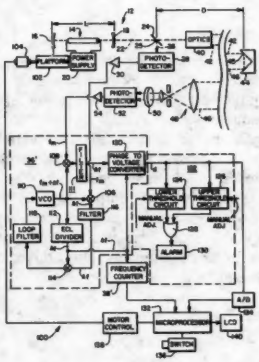
1. In a photomask assembly article comprising a pair of glass plates joined by a flexible hinge, the improvement which comprises a movable arm having first and second ends, and means for attaching the first end of said arm to the top one of said plates whereby said arm does not interfere with said plates in a closed position and said arm is capable of achieving an angled position with respect to said plates when said top plate is raised in an open position wherein the second end of said arm rests on a stationary surface thereby holding said plates in said position.

4,600,299

OPTICAL DISTANCE MEASURING INSTRUMENT

James B. Abshire, Laurel, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 10, 1982, Ser. No. 406,820
Int. Cl.[4] G01C *3/08*
U.S. Cl. 356—5 6 Claims



5. An optical measuring instrument comprising:

a plurality of opposed reflective surfaces (16, 18) forming a resonant optical cavity defining a plurality of longitudinal modes;

a lasing medium (14) axially aligned between said reflective surfaces and generating a composite beam of coherent light passing through one of said reflective surfaces and having frequency components at said longitudinal modes separated by a difference frequency;

a first photodetector (28) exhibiting a square law electrical response to illumination by said coherent light;

a beamsplitter (24) positioned within said composite beam at a fixed distance from said first photodetector to divert a fraction of said composite beam toward said first photodetector;

a second photodetector (52) optically isolated from said first photodetector, exhibiting a square law electrical response to illumination by said coherent light;

an optic system (48) for collecting and focusing onto said second photodetector the reflection from a target of the portion of said composite beam passing through said beamsplitter; and

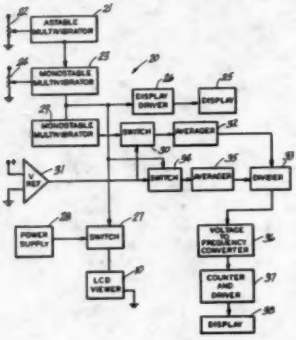
a phase meter (36) responsive to the difference in phase between said first and second photodetector electrical responses for providing an electrical signal indicative of said difference in phase.

4,600,300

METHOD AND APPARATUS TO DETERMINE FREQUENCY OF MOVEMENT AND FOR VISUAL INSPECTION OF MOVING OBJECTS

Gregory A. Rotello, Box 42, Cornwall Bridge, Conn. 06754

Filed Feb. 14, 1983, Ser. No. 466,298
Int. Cl.[4] G01P 3/40
U.S. Cl. 356—23 10 Claims



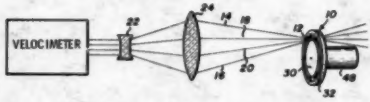
1. Apparatus for determining the frequency of movement or change of an object comprising a liquid crystal viewing device for observing the object, a variable frequency pulse generator providing a square wave having a symmetrical period, a second pulse generator responsive to said variable frequency pulse generator for providing a rectangular wave signal of the same frequency as said variable frequency pulse generator, but having a variable duty factor output coupled to said viewing device for rendering said viewing device transparent at the frequency of said second pulse generator, and means response to said second pulse generator for indicating the frequency of said pulse generators.

4,600,301

SPINNING DISK CALIBRATION METHOD AND APPARATUS FOR LASER DOPPLER VELOCIMETER

Philip K. Snyder, Sunnyvale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 19, 1984, Ser. No. 602,049
Int. Cl.[4] G01P 3/36; G01N 21/00; G01S 9/00; G09B 9/00
U.S. Cl. 356—28.5 11 Claims



1. Apparatus for calibrating a laser Doppler velocimeter having at least one pair of intersecting laser beams that form a measuring locus comprising:

a disk having a hub portion, a rim portion separated from said hub portion and a plurality of fine taut wires radially extending between said hub portion and said rim portion;

means for rotating said disk; and

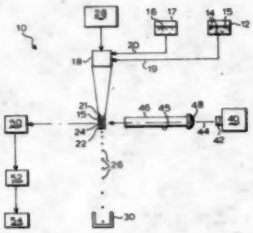
means for determining when said measuring focus is coincident with the center of said disk.

4,600,302

FLOW CYTOMETRY APPARATUS WITH UNIFORM INCOHERENT LIGHT EXCITATION

Burton H. Sage, Jr., Raleigh, N.C., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 26, 1984, Ser. No. 593,470
Int. Cl.[4] G01N 33/48, 21/64
U.S. Cl. 356—39 16 Claims



1. A flow cytometry apparatus for determining characteristics of cells or the like flowing in a liquid stream comprising:

means for moving cells, substantially one at a time, in a liquid flow stream;

an excitation light source for providing a beam of incoherent light to illuminate said cells moving in said flow stream;

an elongate, solid, light transmissive prism having its longitudinal axis aligned substantially along said light beam between said source and said flow stream, said prism having internally reflective side surfaces and light transmissive end surfaces so that non-uniform incoherent light from said source directed into said prism through one of its end surfaces exits said prism through the opposite end surface in uniform fashion as the light is directed toward said cells;

means for detecting light associated with each moving cell as it passes through said area of illumination; and

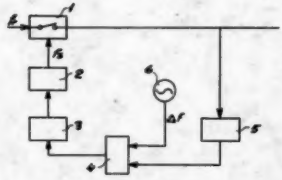
means for using said detected light to determine one or more characteristics of said cells.

4,600,303

METHOD IN THE SIGNAL PROCESSING OF A RECEIVED TRAIN OF PULSES, AND A RECEIVER FOR CARRYING OUT THE PROCESS

Gregers E. Mogensen, Bagsvaerd, Denmark, assignor to Aktieselskabet Nordiske Kabel- og Traadfabriker, Copenhagen, Denmark

PCT No. PCT/DK83/00075, § 371 Date Apr. 2, 1984, § 102(e) Date Apr. 2, 1984, PCT Pub. No. WO84/00613, PCT Pub. Date Feb. 16, 1984
PCT Filed Aug. 4, 1983, Ser. No. 598,297
Claims priority, application Denmark, Aug. 5, 1982, 3508/82
Int. Cl.[4] G01N 21/00; H04B 9/00
U.S. Cl. 356—73.1 8 Claims



1. A method in staggered sampling of a train of pulses with a stable, high repetition frequency, f_r, received by a noise generating detector circuit, in particular for the measurement

of pulse broadening through an optical fibre whose output end is coupled to the input of the detector, characterized in that a received signal is sampled at a staggered frequency, f_s, which is given by

$$f_s=(f_r\pm\Delta f)/n$$

where n is an integer and Δf is several magnitudes smaller than f_r, and that a signal for the sampling of the received signal is generated by means of a pulse generator whose repetition frequency is controlled by means of a phase-detecting circuit, to which there are applied a reference signal indicative of the displacement frequency Δf, and a low frequency signal derived by sampling of the received signal at the frequency f_s, which low frequency signal has sufficient band width to contain essentially all the information in the signal received.

4,600,304

OPTICAL LEVEL

Oded Kafri, Beer-Sheva, and Aminadav Livnat, Arad, both of Israel, assignors to The State of Israel, Atomic Energy Commission, Beer-Sheva, Israel

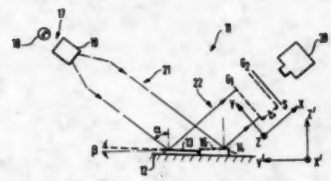
Filed Feb. 2, 1983, Ser. No. 463,323

Claims priority, application Israel, Jul. 23, 1982, 66383

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.⁴ G01B *11/14*

U.S. Cl. 356—138 **8 Claims**



1. An optical instrument arranged for determining the horizontality of a measured surface, said arrangement comprising:

solid reflecting means for placement on said measured surface,

liquid reflecting means disposed adjacent to said solid reflecting means for placement on said measured surface with said solid reflecting means,

collimated light source positioned to direct collimated light beams onto both said solid reflecting means and said liquid reflecting means,

means for generating a first Moire fringe pattern from the solid light reflecting means and for also generating a second Moire pattern from said liquid reflecting means, said means for generating said first and second Moire patterns comprising first and second parallel gratings separated by a known distance Δ and angularly oriented with respect to one another at a small angle θ, the space between said gratings providing an unobstructed path to enable rays passing said first grating to directly reach said second grating, and

screen means for receiving the Moire patterns downstream from said gratings and for simultaneously viewing said first and second Moire patterns to determine the horizontality of said measured surface from the shift of said second Moire pattern relative to said first Moire pattern.

4,600,305

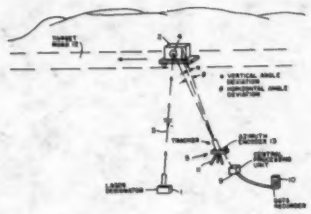
DYNAMIC ENERGY CENTROID LOCATOR AND PROCESSOR (DECLP)

Randolph W. Priddy, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 20, 1984, Ser. No. 641,904

Int. Cl.⁴ G01B *11/26*; G01C *1/00*

U.S. Cl. 356—152 **6 Claims**



1. A testing system for testing a laser designator which is designed to illuminate a spot on a target and maintain the spot in the center of the target comprising a reference electromagnetic energy source located on the target and radiating reference electromagnetic energy out from a center portion of said target; said laser designator being remotely located from said target and illuminating a spot on said target with a laser beam; a measuring device located spatially from said target so as to receive radiation reflected from the spot illuminated by said laser beam and to receive said reference electromagnetic energy; said reference electromagnetic energy and said reflected laser energy following the same optical path from said target to said measuring device; and said measuring means measuring the location of the spot illuminated by said laser beam relative to the location of said reference source and therefore relative to the center of said target.

4,600,306

APPARATUS FOR MEASURING THE LUMINOUS LIFETIME OF A SAMPLE

Kiyoaki Hara, and Issei Yokoyama, both of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 6, 1983, Ser. No. 539,680

Claims priority, application Japan, Oct. 19, 1982, 57-183244

Int. Cl.⁴ G01N *21/64*

U.S. Cl. 356—317 **2 Claims**

1. An apparatus for measuring the luminous lifetime of a sample comprising:

a light source for generating light pulses;

a means for generating a start pulse used as a time standard for said light pulses;

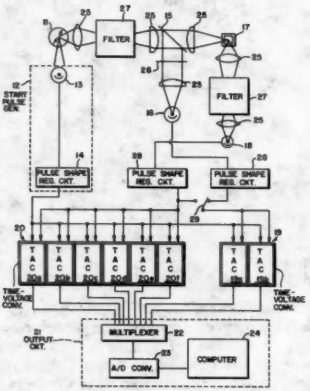
a means for dividing each of said light pulses generated by said light source into two parts;

a first optical detector for receiving one of said two divided light pulses so as to emit a photoelectron pulse so as to thereby measure the pulse shape of an emitted exciting light pulse;

a second optical detector for receiving radiation emitted from said sample to which the other of said two divided light pulses was applied so as to emit a photoelectron pulse so as to thereby measure a luminous shape of said sample;

and a time to voltage converter for measuring the pulse shape of said emitted exciting light pulse and another time to voltage converter for measuring said luminous shape, said two converters being separately respectively connected to said two optical detectors, wherein said two converters are simultaneously activated by said start pulse, said converter for measuring said pulse shape of said exciting light using a photoelectron pulse from said first optical detector as a stop pulse for measuring the pulse

shape of said exciting light while said converter for measuring said luminous shape uses a photoelectron pulse from said second optical detector as a stop pulse for measuring said luminous shape, so as to output a voltage which is proportional to the time from the start of said start pulse to the reception of its respective photoelectron



pulse, whereby said luminous lifetime may be calculated by a deconvolution operation of a histogram obtained on the basis of output voltages of both of said converters; and

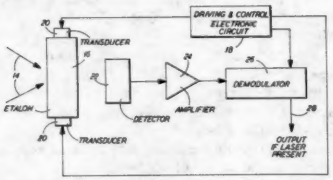
wherein, said converter for measuring said pulse shape of said exciting light and said converter for measuring said luminous shape are connected in parallel by changing-over a change-over switch which is connected thereto.

4,600,307

COHERENT RADIATION DETECTING APPARATUS

William T. Krohn, Danbury; Mark J. McNally, Wilton, and Rene Abreu, Fairfield, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 29, 1983, Ser. No. 518,729
Int. Cl.[4] G01J *9/02*
U.S. Cl. 356—346 **7 Claims**



1. Apparatus for detecting the presence of coherent radiation in the presence of non-coherent ambient radiation comprising:

an unequal optical path length interferometer of the type in which portions of the radiation impinging on the interferometric componenet are caused to be recombined after travelling two different optical paths;

said optical paths differing in length by an amount substantially greater than the coherence length of the non-coherent radiation but substantially less than the coherence length of the coherent radiation;

said unequal optical path length interferometric component comprising a crystalline cell having anisotropic porperties;

means for applying an ultrasonic sound wave to said crystalline cell to vary the effective index of refraction of said crystalline cell in a preselected systematic manner; and

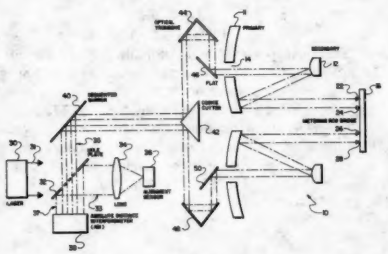
means for detecting the intensity of said recombined portions and producing a signal representative thereof, said signal having a variable component caused by the varying constructive and destructive interference of the recombined coherent radiation components, while the recombined non-coherent radiation components produce only a substantially steady background signal.

4,600,308

PHASE-MATCHING ARRAYED TELESCOPES WITH A CORNER-CUBE-BRIDGE METERING ROD

Thomas R. Waite, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 21, 1983, Ser. No. 544,291
Int. Cl.[4] G01B *11/14*
U.S. Cl. 356—363 **11 Claims**



1. Means for adjusting the optical path lengths in an arrayed telescope system having a plurality of arrayed telescopes, light-reflecting components and beam-splitter means, the arrayed telescope system deriving light from a source positioned at an input reference plane, splitting the light into several beams, and passing a different one of the split beams through each of the telescopes to rigid arrays of retroreflectors in an output plane, and back to the input reference plane, comprising:

optical path length measurement means for sending a light beam along the optical path from the input reference plane to the output plane of each telescope, said optical path length measurement means capable of interferometrically measuring the distance traveled by beams of the coherent light which are retroreflected to said optical path length measurement means;

path-length-adjustment means for individually adjusting the length of each optical path; and

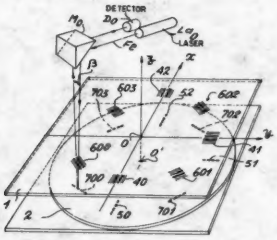
a rigid array of retroreflectors, each retroreflector coupled into a substantially coplanar array substantially transverse to the retroreflected beams with known, calibrated deviations from exact coplanarity to intercept output beams from two adjacent telescopes and reflect therefrom at least three retroreflected beams back along the optical paths to said optical path length measurement means which measures each of the path lengths individually, the apparent positions of each retroreflector relative to the input reference plane being determined and deviations from coplanarity of apparent positions of retroreflectors seen through one telescope with respect to the apparent positions of retroreflectors seen through an adjacent telescope being eliminated by said optical path length adjustment means so that the optical path lengths of the two telescopes are equalized.

4,600,309

PROCESS AND APPARATUS FOR THEOPTICAL ALIGNMENT OF PATTERNS IN TWO CLOSE-UP PLANES IN AN EXPOSURE MEANS INCORPORATING A DIVERGENT RADIATION SOURCE

Bernard Fay, Sarotoga, Calif., assignor to Thomson-CSF, Paris, France

Filed Dec. 27, 1983, Ser. No. 565,814
Claims priority, application France, Dec. 30, 1982, 82 22080
Int. Cl.[4] G01B *11/00*
U.S. Cl. 356—401 **10 Claims**



1. A process for optical alignment along two orthogonal alignment axes of patterns in two planes in close proximity in an exposure means, incorporating a divergent radiation source located at a given distance from the first plane, said patterns having relative dimensional distortions, wherein the process comprises:

a first preliminary stage of inscribing three pairs of reference patterns disposed on two orthogonal axes parallel to said alignment axes and intersecting at a point in a central region of the patterns to be aligned, each pair of the reference patterns including a first reference pattern inscribed on the first plane being formed by at least one lens having linear Fresnel zones, which are alternately opaque and transparent and perpendicular to one of the alignment axes in said plane, and a second reflecting reference pattern inscribed on the second plane and having a central zone perpendicular to said alignment axes, the central zone of the second reference pattern also being etched to form a reflector phase grating having a constant spacing extending parallel to the axes on which they are arranged;

a stage during which the two planes are positioned parallel to one another, to within a given tolerance;

an alignment stage along said two orthogonal axes and in rotation about a third axis orthogonal to the two planes and intercepting the divergent radiation source, said alignment stage consisting of illuminating, by means of a parallel monochromatic light beam, each lens with linear Fresnel zones in such a way as to form in the second plane, a line of light having substantially the same dimensions as the central zone of the second patterns inscribed on said second plane, the detection of a fraction of the radiation reflected by said second plane and emerging from the lens with linear Fresnel zones, the displacement of the two planes relative to one another until the detected radiation passes through an extreme value corresponding to the alignment of the two reference patterns of each pair, followed by the repetition of these operations for each of the axes to be aligned, said divergent radiation source forming on the second plane the image of the pattern of the first plane by a cast shadow with magnification G obeying the equation $G=1+e/D$, in which e is the given tolerance between the two lanes and D the distance separating the source from the first plane;

a second preliminary stage consisting of inscribing on two additional orthogonal axes intersecting at the third axis at least two pairs of supplementary reference patterns of an identical nature to the alignment reference patterns, the reference patterns of each supplementary pair extending in a direction orthogonal to the two orthogonal axes of said three pairs of reference patterns;

a stage following the alignment stage for determining the dimensional distortions of the two patterns consisting of operations of illuminating by a parallel monochromatic light beam each lens having linear Fresnel zones pairs of supplementary reference patterns, in such a way as to form in the second plane a line of light having subtantially the same dimension as the central zone of the patterns inscribed on said second plane, detecting a fraction of the radiation reflected by said second plane and emerging from the lens having linear Fresnel zones in accordance with said orthogonal directions for the displacement of the two planes relative to one another until the detected radiation passes through an extreme value corresponding to the alignment of the two reference patterns, storing the displacement in sign and amplitude, followed by the repetition of these operations for each pair of supplementary patterns and the determination of a correction quantity on the basis of the successive displacement values;

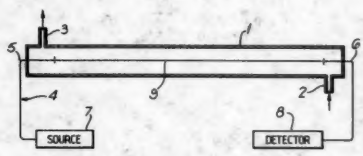
an adjustment stage of said magnification on the basis of the correction magnitude in order to obtain a compensation of the relative dimensional distortions.

4,600,310

OPTICAL FIBRE SENSOR

John H. W. Cramp, St Helens, and Robert F. Reid, Runcorn, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Mar. 29, 1982, Ser. No. 363,228
Claims priority, application United Kingdom, Mar. 30, 1981, 8109913
Int. Cl.[4] G01N *21/59*
U.S. Cl. 356—432 **10 Claims**



1. Apparatus for detecting changes in chemical or physical parameters, comprising:

a sensing optical fibre including a core surrounded by a relatively sensitive cladding the absorption spectrum of which varies with changes in chemical or physical parameters when these are applied to said relatively sensitive cladding; and

transmissive optical fibre means, including a core surrounded by a relatively insensitive cladding the absorption spectrum of which tends not to vary with changes in the chemical or physical parameters when these are applied to said relatively insensitive cladding, for connecting at least one end of the sensing optical fibre to a remote light source and a remote detector;

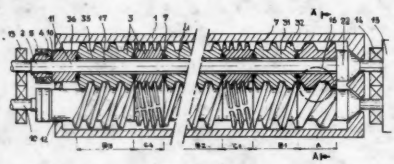
the core of the sensing optical fibre having substantially the same diameter as the core of the transmissive fibre means; said relatively insensitive cladding refractive index being less than the refractive indices of the cores of both the sensing optical fibre and the transmissive optical fibre means.

4,600,311

MATERIAL-PROCESSING SCREW MACHINE

Francis Mourrier, Autun, and Félix Pelissier, Le Creusot, both of France, assignors to Clextral, Paris, France

Filed Mar. 7, 1985, Ser. No. 709,273
Claims priority, application France, Mar. 8, 1984, 84 03583
Int. Cl.[4] B29B *1/06;* B01F *7/08*
U.S. Cl. 366—88 4 Claims



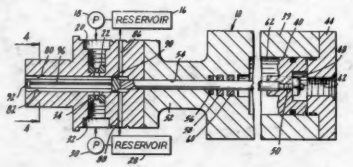
1. A material-processing screw machine comprising a sleeve, at least one screw inside the sleeve, means for driving the screw in rotation, the screw including a central driving shaft, a plurality of screw elements mounted on the shaft and a sealing gasket interposed between the screw elements, the screw elements and gaskets forming a stack of adjoining elements, an abutment placed at one end of the shaft and clamping means placed at an opposite end of the shaft, said clamping means being capable of exerting on the stack of elements a pre-stressing force capable of opposing separation of the screw elements from each other in operation of the machine, said clamping means comprising a hydraulic jack including two members consisting of a piston and a cylindrical body in which the piston is movable, one of said two members bearing against the central shaft and the other of said two members bearing against the stack, and means for mechanically locking the piston relative to the body of the jack after the stack has been pre-stressed.

4,600,312

IMPINGEMENT MIX-HEAD FOR RIM PROCESS

Jerry V. Scrivo, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 8, 1985, Ser. No. 709,868
Int. Cl.[4] B01F *15/02;* B01J *19/00*
U.S. Cl. 366—159 5 Claims



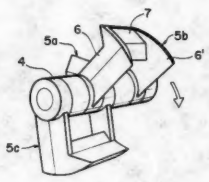
1. A mix-head assembly for combining two or more chemical streams for mixing and discharge into a mold cavity comprising: a mix-head body having means therein defining a longitudinal mixing bore with spaced, separate channels along the length thereof and a plurality of inlet openings, each of said inlet openings communicating with one of said channels to direct a chemical composition stream into said mixing bore, said mixing bore having an outlet end defining a discharge port for flow of a mixture of streams from said mixing bore to a mold cavity, means defining a return port in said body communicating with each of said channels, a slide plunger of constant diameter along its length in sliding fit relationship with the inside diameter of said bore, and a key element on the end of said slide plunger including a pair of ribs that reciprocate in said channels to selectively discharge residual material from the mix-head body through said discharge port and block flow through said discharge port to cause recirculation flow from each of said inlet openings through one of said channels to one of said return ports.

4,600,313

KNEADING MACHINE

Akira Moroo, Tokyo; Yoshiyasu Tokunaga, Hatano; Takashi Suzuki, Isehara, and Tadahiko Yoshioka, Kawasaki, all of Japan, assignors to Inoue Seisakusho (Mfg.) Co., Ltd., Isehara, Japan

Filed Nov. 28, 1984, Ser. No. 675,968
Claims priority, application Japan, Mar. 23, 1984, 59-54523
Int. Cl.[4] B01F *7/04*
U.S. Cl. 366—313 7 Claims



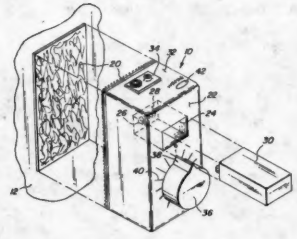
1. A kneading machine comprising a container having a cylindrical wall and having a supply opening and a discharge opening in said cylindrical wall for a material to be treated, a rotational driving shaft positioned on a center axis of said cylindrical wall, means for rotating said driving shaft in a predetermined direction of rotation, and a plurality of radial blades mounted on said shaft, each of said blades comprising a pair of radial side plates and a kneading blade extending between the ends of said side plates remote from the shaft, each kneading blade having an outer end positioned at a radial location such as to provide a kneading gap between said outer end and the cylindrical container wall, and having a leading surface extending both inwardly from said outer end, and forwardly therefrom with reference to said direction of rotation, at an angle such as to provide a tapered space between said leading surface and the cylindrical container wall on the forward side of said kneading blade.

4,600,314

SMOKE DETECTOR CUTOFF TIMER

George E. Theriault, 23 Waverly Pl., New York, N.Y. 10003

Filed Oct. 26, 1984, Ser. No. 665,179
Int. Cl.[4] G04B *47/00*
U.S. Cl. 368—10 4 Claims



1. A smoke detector system having a smoke detector and a mountable remote cutoff timer for said smoke detector, that controls power from a battery, said timer comprising:

a unit separate and remotely disposed from, but with electrical connected means to, the smoke detector;

a timer contained within said unit;

battery coupling means within said unit for receiving the

battery which can remotely energize the smoke detector, said timer capable of disengaging the battery from energization of the smoker detector for a selected period of time; and

indicator means on said unit for indicating improper connection of the battery to the unit.

4,600,315

WHOLE BODY SWINGABLE CLOCK

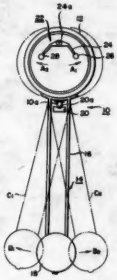
Norihiko Nakamura, Tokyo, Japan, assignor to Rhythm Watch Co., Ltd., Tokyo, Japan

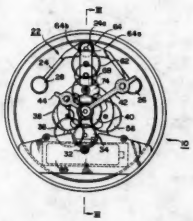
Filed Apr. 25, 1984, Ser. No. 603,631

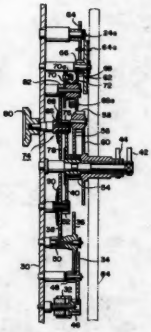
Claims priority, application Japan, Apr. 28, 1983, 58-64421[U], Apr. 28, 1983, 58-64422[U]

Int. Cl.[4] G04B *1/00*

U.S. Cl. 368—135 **5 Claims**







1. A whole body swingable clock comprising:

a clock body swingingly supported on the pendulum fulcrum;

an additional pendulum contained in said clock body to swing said clock body by means of movement of gravity center position;

said clock body containing a clock drive mechanism having a clock drive gear train to indicate a certain time and containing an additional pendulum drive mechanism having an additional pendulum drive gear train to drive said additional pendulum;

said additional pendulum drive gear train prepared with an escape wheel, a pallet fork which engages with the escape wheel to swing and is connected to said additional pendulum and a urging means which provides the predetermined rotating force to the escape wheel so that the rotation of the escape wheel enables the engaging conditions between the escape wheel and the pallet fork to be changed to swing the pallet fork and said addtional pendulum connected thereto and further the whole clock body;

wherein said clock drive gear train and said additional pendulum drive gear train are arranged to be linked with each other so that said clock drive gear train can wind up said urging means to accumulate the urging force, and both of two gear trains can be driven by a single drive means.

4,600,316

WATCH HAVING AN ANALOG AND DIGITAL DISPLAY

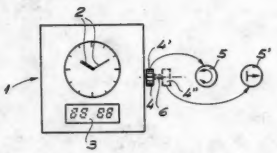
René Besson, Neuchâtel, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

Filed Oct. 10, 1984, Ser. No. 659,265

Claims priority, application Switzerland, Oct. 25, 1983, 5772/83

Int. Cl.[4] G04C *9/00*

U.S. Cl. 368—187 **6 Claims**



1. An electronic watch comprising

a time base arranged to provide a standard frequency signal;

indicating means arranged to display a first group of time information items in analog form, one of said indicating means being a minutes indicator;

a stepping motor mechanically coupled to said indicating means;

a control circuit arranged to supply drive pulses to the motor so as to effect displacement of said indicating means in response to time pulses provided by the divider circuit as well as to correcting pulses;

a counting circuit likewise receiving time pulses from the divider circuit thereby to provide signals representing a second group of time information items of which at least one information item is included in said first group;

an electro-optic display coupled to said counting circuit in order to display the second group of time information in digital form;

manual control means; and

a selecting and correcting logic circuit responsive to operation of said manual control means thereby to place the watch in different display modes for each of which a selected time information is displayed by said electro-optic display means, in different correction modes for each of which a displayed information item may be corrected through application by said logic circuit of correcting pulses to the counting circuit, said logic circuit likewise applying correcting pulses to the motor control circuit whenever the information to be corrected is common information to both groups, said common information

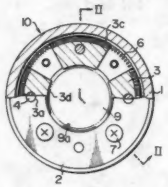
being the minutes information and said minutes indicator normally advancing by n steps per minute, n being at all times greater than 1, in a manner to modify the analog and digital indications of said common information by the same quantity, and in a supplementary synchronization mode in which said common information is displayed by said electro-optic digital display and in which said logic circuit responds to an operation of the manual control means by applying correcting pulses only to the motor control circuit in order to enable bringing the analog indication into coincidence with the digital indication of said information, wherein the motor control circuit is adapted to bring said minutes indicator automatically to an integral minute indication at the moment of switching to the synchronization mode and in said mode to generate and to apply n successive drive pulses to the motor in response to each correcting pulse which said motor control circuit receives from the logic circuit.

4,600,317

PAD TYPE JOURNAL BEARING DEVICE WITH A CONSTANT BEARING CLEARANCE

Sanae Mori, Nagoya, Japan, assignor to Daido Metal Company Ltd., Nagoya, Japan

Filed Mar. 5, 1985, Ser. No. 708,537
Claims priority, application Japan, Mar. 16, 1984, 59-50830
Int. Cl.[4] F16C *17/03, 27/02*
U.S. Cl. 384—117 **10 Claims**



1. A pad type journal bearing device including a plurality of bearing pads disposed in circumferentially spaced relationship to each other in a casing and swingable about axes parallel to the axis of a rotating shaft, the improvement comprising

a resilient return member disposed in said casing for biasing said bearing pads in a manner to maintain a constant clearance between said rotating shaft and said bearing pads,

wherein said each bearing pad is formed between its partially cylindrical, inner peripheral surface and its partially cylindrical, outer peripheral surface with an aperture extending axially of said rotating shaft and at its outer peripheral surface with a circumferentially extending groove, and said resilient return member is mounted under tension of the grooves of said respective bearing pads to maintain a constant bearing clearance, and further comprising pins each loosely fitted in said each aperture and secured to said casing for allowing said each bearings pad to swing about an axis parallel to the axis of said rotating shaft.

4,600,318

THRUST BEARING AND SEAL ASSEMBLY

E. K. Miller, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 1, 1985, Ser. No. 761,485
Int. Cl.[4] F16C *33/72, 33/74*
U.S. Cl. 384—130 **8 Claims**

1. A thrust bearing and seal assembly for use in a gear pump or the like comprising:

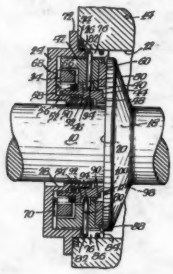
a shaft;

an annular shoulder on said shaft;

an annular cup-shaped bearing and seal housing disposed about said shaft and opening toward said shoulder;

a gimball washer within said housing and having two, diametrically opposite points of contact therewith;

an annular thrust bearing about said shaft and within said housing and having a bearing pad abutting said shoulder and a surface opposite said pad abutting said washer at two diametrically opposite locations, angularly spaced



from said two diametrically opposite points, said bearing having an inner diameter spaced from said shaft sufficiently to define an annular, seal receiving space;

an annular seal disposed within said space about said shaft and axially movable therein relative to said bearing, said seal having a peripheral sealing surface facing said shoulder; and

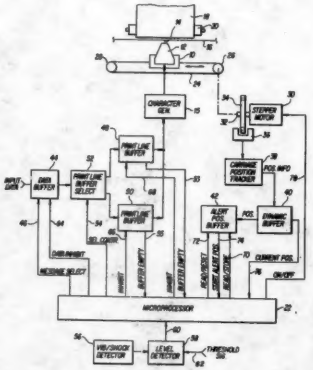
means within said housing and engaging said seal for biasing said sealing surface against said shoulder.

4,600,319

CONTROL FOR DOT MATRIX PRINTERS OPERATING IN HARSH ENVIRONMENTS

Seth L. Everett, Jr., Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 6, 1985, Ser. No. 741,940
Int. Cl.[4] B41J *29/38*
U.S. Cl. 400—54 **22 Claims**



1. A method of controlling the operation of printing apparatus subjected to relatively high levels of vibration and shock, comprising the steps of:

sensing said shock and/or vibration;

terminating printing operation when the level of said shock and/or vibration exceeds a predetermined threshold level;

temporarily storing any further input data utilized for printing indicia on a printing medium during a period when said predetermined threshold level is exceeded; and

thereafter releasing said input data temporarily stored and resuming normal printing operation when the level of said shock and/or vibration falls below said threshold, whereby substantially no data is lost or illegible characters are printed when the apparatus is experiencing vibration and/or shock beyond a safe operating level.

12. Apparatus for controlling an impact type printer subjected to relatively high levels of vibration and shock, comprising:

means for sensing said shock and/or vibration and generating a control signal when the level of said shock and vibration exceeds a predetermined magnitude;

control means for controlling the operation of said printer and being responsive to said control signal for interrupting a printing operation as long as said predetermined magnitude is exceeded;

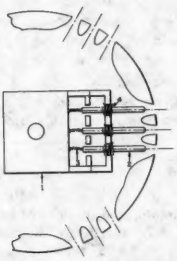
data memory means controlled by said control means for temporarily storing input data used for the printing of indicia on a printing medium during a period when said predetermined magnitude is exceeded;

said control means being further operable to cause said data memory means to release said data temporarily stored and to reinitiate said printing operation when the level of said shock and/or vibration falls below said predetermined magnitude, whereby substantially no data is lost or illegible characters are printed when the apparatus is experiencing vibration and/or shock beyond a safe operating level.

4,600,320
PRINTER FOR PRODUCING BOTH BRAILLE CHARACTERS AND PRINTED CHARACTERS

Thomas H. Hoovler, Park School of Buffalo 4625 Harlem Rd., Snyder, and Antonina Vertino, 10 Mona Dr., Eggertsville, both of N.Y. 14226

Filed Nov. 26, 1984, Ser. No. 675,024
Int. Cl.[4] B41J 3/32
U.S. Cl. 400—122 5 Claims



1. A printer for producing both standard printed characters and braille characters on a recording medium, comprising:

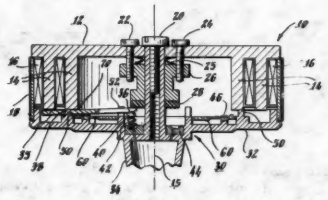
a platen having a generally cylindrical exterior recording medium supporting surface, said platen being rotatable about its central axis, said surface having alternating solid and perforated regions, said regions extending along the surface of said platen in a direction parallel to said central axis, said solid portions serving as a backing surface for said recording medium as said standard printed characters are printed, said perforated portions comprising holes formed in six-dot braille patterns;

a braille printing actuation device located in the interior of said cylindrical platen, said actuation device comprising a base housing, a plurality of embossing pins and a plurality of solenoids housed in said base housing, one solenoid being furnished for each pin, each solenoid, upon actuation, serving to drive its associated pin outwardly through one of said holes formed in said platen so as to form braille characters in said record media at the same time that a corresponding standard character is being printed on said sheet adjacent said braille character.

4,600,321
MATRIX PRINT HEAD

Okun Kwan, 41 Inca Dr., Trumbull, Conn. 06611

Filed Feb. 6, 1985, Ser. No. 698,556
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 8 Claims



1. In a high speed matrix print head having a plurality of print pins spaced about a central axis and being longitudinally movable about said axis between a print and a non-print position, a plurality of guide means for guidably supporting said plurality of print pins, a plurality of armature members circumferentially spaced in an armature housing and extending radially outward from said central axis, each having an inner portion engageable with one of said print pins for driving said print pins when actuated on an outer portion thereof, a plurality of electromagnetic means each having a magnetic yoke mounted adjacent to the outer portions of said armatures for causing pivotal movement of said armature with said outer portion moving toward said electromagnetic means when a magnetic force is applied thereto and said inner portion of said armature striking its associated print head, an improved matrix print head comprising:

armature positioning and guide means for each of said armatures in said armature housing for positively locating said armatures in said housing with a minimum of lateral movement of said armatures in said housing,

a unitary armature guide and supporting spring means mounted in said armature housing having a radially extending and circumferentially spaced leg in alignment with each of said armatures, each of said legs having a foot with a longitudinal linear ridge extending upwardly thereon transverse to said radially extending legs, each of said longitudinal linear ridges precisely establishing a fulcrum contact line for said armatures between said armature guide and supporting spring means and said magnetic yokes and providing a predetermined spring load along said fulcrum contact line.

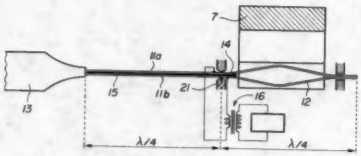
4,600,322
NEEDLE MATRIX PRINTER

Jacques Vermot-Gaud, Perly, and Didier Joyeux, Petit-Lancy, both of Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Filed Mar. 1, 1985, Ser. No. 707,374
Claims priority, application Switzerland, Mar. 7, 1984, 1124/84
Int. Cl.[4] B41J 3/12
U.S. Cl. 400—124 9 Claims

1. Needle matrix printer comprising a set of needles each of which is connected to a support and has one free end, guide members for these needles, and means for applying said free ends selectively against a writing surface associated with pressure-sensitive marking means, each needle being made as an

electrical conductor of which a portion is offset laterally of a straight line joining said guide means to the integral end of said support and which needle is connected across said portion to the two respective poles of a current source, a magnetic field generator being disposed so as to create a field which, in the presence of a current within said portion of the conductor, gives rise to electrodynamic forces tending to further offset said portion from said axis or to restore it thereto as the case may be, according to the sense or direction of the current, characterized by the fact that said portion is contained in a plane common to the remainder of the electrical conductor



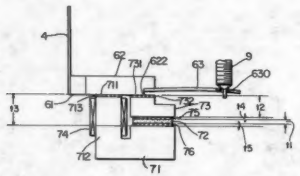
which forms said needle, the poles of said magnetic field generator are disposed on either side of this plane to give a uniform field whose lines of force are perpendicular to said plane, each needle comprises two symmetrical parts, one on either side of a plane passing through the straight line which joins the support to the guide means and perpendicular to the plane containing the needle, the adjacent portions of these symmetrical parts adjacent to the support being electrically insulated from one another and connected to the two terminals of said current source, the adjacent portions remote from said support being in electrical contact.

4,600,323

PRINTING HEAD ASSEMBLY

Mineo Harada, Owariasahi; Tetsuji Shimojo, Woariasahi, and Kaname Furuya, Kasugai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1985, Ser. No. 690,270
Claims priority, application Japan, Jan. 25, 1984, 59-10018
Int. Cl.[4] B41J *3/12*; C04B *35/04*
U.S. Cl. 400—124 **14 Claims**



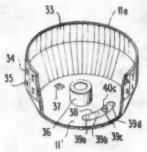
1. An armature actuating mechanism, comprising:
(a) an armature;
(b) a resilient member fixed to one end of said armature;
(c) a permanent magnet for attracting said armature while resiliently deflecting said resilient member;
(d) an electro-magnet including a core having a magnetic surface facing the armature and coils wound around the core and adapted to cancel the attracting force produced by said permanent magnet;
(e) first magnetic member connected magnetically to said core of the electro-magnet;
(f) second magnetic member located adjacent to said permanent magnet and having a magnetic surface facing the armature;
(g) a first magnetic bonding material layer between one side of said permanent magnet and said first magnetic member;
(h) a second magnetic bonding material layer between the other side of said permanent magnet and said second magnetic member; and
(i) said magnetic material layer including mixed magnetic particulate material and bonding means for bonding said permanent magnet to said first and second magnetic members.

4,600,324

PRINT THIMBLE RECOGNIZING SYSTEM FOR A SERIAL PRINTER

Shigemitsu Matsumori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 14, 1983, Ser. No. 551,533
Claims priority, application Japan, Nov. 12, 1982, 57-198583
Int. Cl.[4] B41J *1/32*
U.S. Cl. 400—144.1 **18 Claims**



1. A serial printer comprising:
a print thimble including a plurality of elastic fingers, a plurality of character types formed on said plurality of elastic fingers, and protuberances selectively formed on a recognition code-forming area identifying the print thimble;
detection means for detecting the presence or absence of said protuberances at said recognition code-forming area of said print thimble to produce a detection signal, said detection means including a solenoid having a plunger which is capable of being protruded and switching means engaging said plunger whereby the opening and closing of said switching means is controlled by the movement of said plunger, said solenoid being disposed in alignment with said recognition code-forming area of said print thimble so as to be able to mechanically contact said protuberances; and
means for recognizing the kind of said print thimble in response to said detection signal.

4,600,325

PRINTING APPARATUS

Tsugio Okamoto, and Junichi Maeda, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 10, 1984, Ser. No. 659,310
Claims priority, application Japan, Oct. 15, 1983, 58-193190
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 **1 Claim**

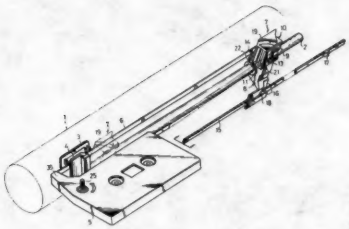
1. A printing apparatus comprising:
(a) a frame;
(b) an elongated platen rotatably supported by said frame;
(c) a carriage mounted for movement reciprocally along said platen within a fixed range;
(d) a print head supported on said carriage;
(e) a ribbon cassette housing an ink ribbon and replaceably mounted at one end of said frame, a portion of said ink ribbon extending outwardly from said cassette as a loop;
(f) a ribbon guide body mounted for movement along said platen in the same direction as said carriage, said ribbon guide body located at a position inside said loop of said ink ribbon, and disengageably locked at a predetermined position when said ribbon guide body is moved to the end

of said frame opposite the end on which said ribbon cassette is mounted;

(g) a guide rod extending along said platen for movably supporting said carriage and said ribbon guide body thereon;

(h) a guide rail adjacent to and parallel with said guide rod for slidably guiding said ribbon guide body, said guide rail having a locking portion for locking said ribbon guide body at one end of said guide rod so that said ribbon guide body does not rotate on said guide rod and the ink ribbon is maintained parallel with the platen;

(i) a suporting member included in said ribbon guide body and slidably provided on said guide rod so as to support the overall ribbon guide body and to be locked by being engaged with said locking portion on said guide rail, said supporting member having an engaging means constituted



by a fork-shaped engaging portion with an open upper end, an engaging piece located on the side of said fork-shaped engaging portion, and a supporting shaft;

(j) a guide roller supported on said supporting shaft of said supporting member to lead said ink ribbon over the peripheral surface of said guide roller; and

(k) an operating member secured onto said supporting member and including a knob for moving said ribbon guide body, said operating member having an engaging means for engaging said engaging means on said supporting member and for securing said operating member on said supporting member, said engaging means of said operating member being constituted by an engaging piece for being engaged by said fork-shaped engaging portion, an engaging claw for engaging said engaging piece, and a recess for receiving the upper end of said supporting shaft.

4,600,326

CASING STRUCTURE FOR ELECTRICAL AND MECHANICAL UNITS

Toshiharu Fudatsuji, Yokohama; Kazuhiro Gooda, Kawasaki, and Takao Imazeki, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1984, Ser. No. 670,294

Claims priority, application Japan, Nov. 14, 1983, 58-213675; Nov. 14, 1983, 58-175620[U]; Nov. 26, 1983, 58-222397

Int. Cl.[4] B41J *29/02*

U.S. Cl. 400—691 **5 Claims**

1. A casing structure for accommodating electrical and mechanical units including heat and sound sources, comprising:

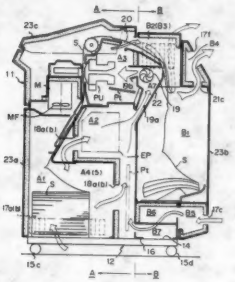
(a) a first, a second and a third compartment, each having respective air inlets and outlets, said first compartment being connected to said second compartment, which is connected in turn to said third compartment, through respective connecting passages including their air outlets and inlets to constitute an air flow passage through the first, second and third compartments arranged in series;

(b) a heat source and a sound source arranged in said intermediate, second compartment;

(c) a fourth compartment positioned in the connecting passage between said first and second compartments;

(d) an air cooling fan disposed in said fourth compartment so as to be in the vicinity of said heat source in said second compartment,

wherein cooling air is circulated through said air flow passage from said first compartment via said second compartment toward said third compartment and said heat source is compulsorily cooled by said cooling fan;



(e) a first casing unit for containing said first and second compartments; and

(f) a second casing unit for containing said third and fourth compartments,

wherein said second casing unit is connected to said first casing unit so as to be able to open and close with respect to said first casing unit.

4,600,327

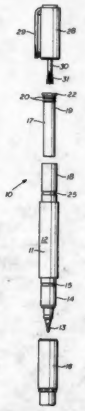
WRITING PEN WITH CORRECTION FLUID RESERVOIR

Joe O. Guzman, 5110 Academy, #4, Houston, Tex. 77005

Filed Nov. 28, 1984, Ser. No. 675,866

Int. Cl.[4] B43K *29/04*

U.S. Cl. 401—18 **4 Claims**



1. A writing instrument with combined ink applicator and correction fluid reservoir comprising;

a writing instrument having an ink applicator at one end and a hollow cylindrical portion at the opposed end,

a first closure member removably received on said instrument at said one end to enclose said ink applicator and comprising a cylindrical cap enclosed at one end and having an annular bead disposed on the interior surface,

said writing instrument having a circumferentially disposed groove adapted to removably receive said annular bead,

a tubular reservoir containing opaque correction fluid open at one end and removably received and carried within the hollow cylindrical portion at said opposed end of said instrument,

said tubular reservoir comprises an elongated tubular portion open at one end adapted to be frictionally and slidably received within the hollow cylindrical portion of said instrument, a circumferential flange surrounding said open end and extending radially therefrom to rest on the top surface of the hollow cylindrical portion of said instrument,

a second closure member removably received on said instrument at said opposed end to sealably enclose the open end of said reservoir and comprising a cylindrical cap enclosed at one end and having an annular bead disposed on the interior surface,

said writing instrument having a circumferentially disposed groove adapted to removably receive said annular bead and simultaneously upon receipt therein said enclosed end sealably enclosing the open end of said reservoir, and

a fluid applicator secured to and carried by said second closure member comprising a tubular brush stem having bristles at the inner end thereof removaly received within said reservoir in a stored position.

4,600,328

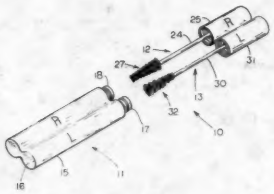
MASCARA APPLICATOR

Brenda Clements, Rte. 4, Box 34, Cordele, Ga. 31015

Filed Oct. 15, 1985, Ser. No. 787,133

Int. Cl.[4] A46B *11/00;* **A45D** *40/26*

U.S. Cl. 401—129 **7 Claims**



7. A mascara applicator for applying mascara with the same hand to the lashes of both left and right eyes, and with the applicator comprising two brushes having a mass of bristles in the general shape of a cone formed along an end of each brush opposite a handle end, and with the conical apex of one bristle mass being located at the top of said brush end of one of said brushes and with the conical base of the other bristle mass being located at the top of said brush end of the other of said brushes, and a container having two cells adapted to house two supplies of mascara in mutual isolation with one of said cells and one of said brushes being marked for right eyelash usage and with the other of said cells and the other of said brushes being marked for left eyelash usage.

4,600,329

FOLDER FOR PAPER SHEETS OR THE LIKE

Manuel Ferreira-Godinho, Bergiusweg 10, D-3250 Hameln 1, Fed. Rep. of Germany

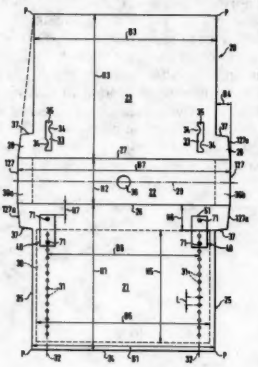
Filed Nov. 13, 1984, Ser. No. 670,633

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1983, 3341175; May 18, 1984, 3418456; Jul. 18, 1984, 3426509; Jul. 27, 1984, 3427855

Int. Cl.[4] B42F *13/00, 15/00;* **B42D** *3/04, 17/00*

U.S. Cl. 402—74 **20 Claims**

1. A folder for paper sheets or the like, comprising a carrier body (20), said body including a bottom (21) and a back (22) and a cover (23) having adjoining portions joined to each other by means including permanently foldable creases (26,27), said bottom (21) having a line-up means for aligning the paper sheets, characterized in that at least the adjoining portions of said bottom (21) and of said cover (23) adjoining said back (22) have a width (B7) in excess of the width of the remaining portions (B1,B3) of said bottom (21) and of said cover (23), and



that said adjoining portions having said width define a substantially rectangular configuration and defining symmetrical lugs (28) of equal size on either side of said back (22), said lugs being integrally formed with the carrier body (20) and defining a stepped configuration.

4,600,330

FRAME, MORE PARTICULARLY FOR A SHOWER PARTITION

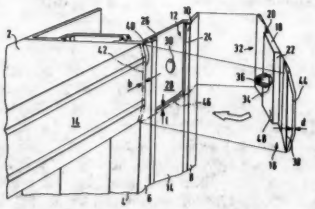
Heinz G. Baus, 35, Wartbodenstrasse, CH-3626 Hünibach/-Thun, Switzerland

Filed Dec. 9, 1983, Ser. No. 559,822

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1982, 3245573

Int. Cl.[4] F16B *11/00*

U.S. Cl. 403—23 **23 Claims**

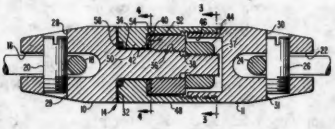


1. A frame suitable for a shower partition having a facing side and being formed of at least two rails angularly connected together at a joint area formed by butting an end of one rail against a side of another rail and connecting the rails to each other, said frame further comprising a generally flat facing element having a facing side and further having locking means on the side thereof opposite said facing side; means defining a groove on one of said rails in said joint area and on said facing side of said frame, in which groove said facing element is removably received with the facing side thereof essentially parallel with the facing side of said frame, and recess means in said joint area cooperating with said locking means to lock said facing element removably in said groove, said facing element having a size sufficient to cover said joint area fully.

4,600,331
SWIVEL COUPLING

Charles E. Gray, Ledyard, Conn., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jun. 19, 1985, Ser. No. 746,302
Int. Cl.[4] F16D 1/12
U.S. Cl. 403—165 7 Claims



1. A swivel coupling comprising the combination of

a spindle having a central, axially extending, externally threaded cylindrical core;

means on said spindle for connection to a first axial force transmission device;

an end cap;

means on said end cap for connection to a second axial force transmission device;

a cylindrical tubular sleeve attached to said end cap and surrounding said core,

said sleeve having a radially inwardly protruding flange near the distal end thereof;

said flange having means defining a shoulder facing axially toward said end cap;

an internally threaded thrust nut surrounding said core within said sleeve and threadedly engaging the external threads on said core,

said thrust nut having an axially facing end surface opposite to and facing said shoulder;

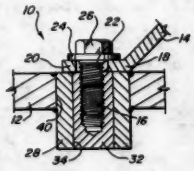
a washer of low-friction polymeric material between said shoulder and said end surface to permit said spindle and said end cap to be relatively rotatable when oppositely directed axial forces are applied to said first and second axial force transmission devices; and

a lock nut on said core to lock said thrust nut in position, and wherein said core has a smaller diameter threaded end portion to threadedly receive said lock, nut and a larger diameter adjacent threaded portion to threadedly receive said thrust nut.

4,600,332
ALUMINUM/TITANIUM TRANSITION JOINT BETWEEN ALUMINUM AND STEEL BODIES

William F. Sharp, Louisville; John G. Banker, Boulder, and Roy Hardwick, Louisville, all of Colo., assignors to Explosive Fabricators, Inc., Louisville, Colo.

Filed Jan. 11, 1985, Ser. No. 690,605
Int. Cl.[4] F16B 35/00
U.S. Cl. 403—179 10 Claims



1. A transition joint between an aluminum body and a steel object to be joined to the aluminum body comprising in combination:

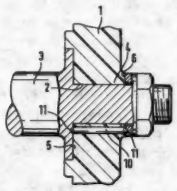
an aluminum component secured to the aluminum body, said aluminum component having an internal space provided therein, and

a titanium core secured in the internal space of said aluminum component, said titanium core including joinder means for being joined to said steel object.

4,600,333
POLYMERIC COMPONENT

Harald Röhrig, Bonn, and Günther Rudolf, Höchstadt, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,809
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411640
Int. Cl.[4] F16B 9/00
U.S. Cl. 403—259 8 Claims

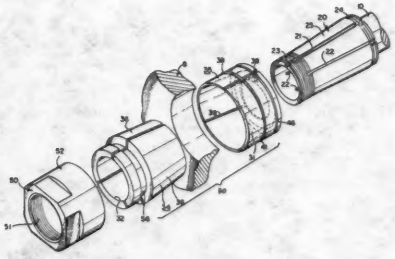


1. A polymeric component (1) having a bore (2) to receive a shaft (3), the component (1) having, in a zone (4) around the bore (2), substantially planar and parallel end faces disposed perpendicular to the axis of the bore, the component being clamped between substantially radial abutment surface (5,6) characterized in that a number of axially continuous metal pins (7) are distributed radially outward of said of the bore (2) and are disposed in the zone (4) around the bore (2) and bear by their ends on the abutment surface (5,6).

4,600,334
MOUNTING DEVICE WITHOUT AXIAL MOTION

Dimitri G. Soussloff, Wyomissing, Pa., assignor to Fenner America Inc., Manheim, Pa.

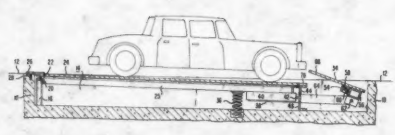
Continuation-in-part of Ser. No. 594,950, Mar. 20, 1984, Pat. No. 4,543,704. This application May 22, 1985, Ser. No. 736,681
Int. Cl.[4] F16B 2/14
U.S. Cl. 403—369 14 Claims



1. A mounting device for mounting a machine element having a cylindrical bore coaxially on a shaft having a cylindrical surface, said device comprising a segmented inner first sleeve encircling the shaft and comprising an integral member having a straight cylindrical interior bore corresponding in diameter to the external cylindrical surface of said shaft and having a tapered external surface and external threads at one end thereof, a two-part second sleeve encircling said inner sleeve,

the interior part of said second sleeve comprising a wedge having a tapered internal surface corresponding in angle of taper to the tapered external surface of said first sleeve, the exterior part of said second sleeve circumscribing said interior part and having a straight cylindrical outer surface corresponding in diameter to the cylindrical bore of said machine element, and a clamping nut threadedly engaged with the threaded end of said inner sleeve, the segments of said inner first sleeve providing a plurality of terminated axial slots extending longitudinally of said inner sleeve, each extending from one of the ends of the inner sleeve and terminating short of the other of the ends, and a single axial through-slot extending from end to end of the inner sleeve to permit contraction and expansion of said interior bore without disturbing the integrity of said member, the interior part of said second sleeve comprising a plurality of separate separable segments circumscribed by said exterior part, said exterior part being expandable and contractable and extending axially beyond said interior part remote from said clamping nut and having abutment means engaging said first sleeve to limit axial displacement of said exterior part of said second sleeve relative to said first sleeve, said interior part of said second sleeve having circumferential interlock means providing opposed forward and rearward radial surfaces substantially perpendicular to the central axis of said shaft, said clamping nut having cooperating circumferential interlock means defining opposed forward and rearward drive surfaces confronting the corresponding surfaces of the interlock means of said interior part, whereby upon rotation of said nut in one direction, the forward surfaces of the respective interlock means engage and effect axial displacement of said interior wedge part in one direction relative to both said first sleeve and said exterior part, and upon rotation of said nut in the opposite direction, the rearward surfaces of the respective interlock means engage and effect relative axial displacement of said interior wedge part in the opposite direction relative to both said first sleeve and said exterior part, said displacements causing said tapered surfaces to afford radial expansion and to contract the interior bore of the inner first sleeve and to afford radial contraction and to expand the exterior part of said second sleeve.

4,600,335
VEHICLE ACCESS CONTROL DEVICE
Ralph Truglio, 107 W. Baldwin St., Hackettstown, N.J. 07840
Filed Feb. 9, 1984, Ser. No. 578,663
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **1 Claim**



1. A device for blocking vehicle movement along a road surface from a direction upstream to downstream comprising

a pressure plate pivotally mounted in coplanar relation with the road surface at its upstream end having a downstream end vertically displaceable in a downward direction below the road surface, in response to vehicle weight thereon,

spring means normally biasing the downstream end of said pressure plate in coplanar relation with said road surface,

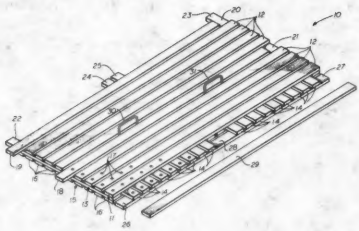
a pivotally mounted barrier plate normally biased in coplanar relation with said road surface having its upstream end disposed in abutting relation with the downstream end of said pressure plate and a downstream end disposed remote therefrom and normally coplanar with the road surface,

means for precluding downward displacement of said upstream end of said barrier plate below the level of said road surface,

means pivotally mounting said barrier plate intermediate its upstream and downstream ends for normally biasing said plate in coplanar relation with said road surface and to permit its displacement from its normally biased first position coplanar with said road surface to a second position wherein said upstream end thereof is elevated into vehicle engaging relation above said road surface, and its downstream end is displaced downwardly below the road surface, linkage means mechanically interconnecting the downstream end of said pressure plate with said barrier plate intermediate said pivotal mounting means and the upstream end thereof to effect pivotal displacement of the barrier plate from its first to its second position in response to downward displacement of the downstream end of said pressure plate, and

selectively actuatable means for preventing downward displacement of said downstream end of said pressure plate in response to vehicle weight thereon to preclude undesired elevation of said barrier plate.

4,600,336
INTERLOCKING WOODEN MAT
A. J. Waller, Jr., 2635 Grand Blvd., Port Neches, Tex. 77651
Filed Mar. 9, 1984, Ser. No. 588,043
Int. Cl.[4] E01C *5/14, 9/08*
U.S. Cl. 404—35 **24 Claims**



1. A laminated wooden mat section of at least three ply construction adapted to be secured in interlocking relation to other like mat sections for supporting heavy equipment and vehicles around or leading to oil field drilling sites or the like, said mat section comprising;

a lower layer of substantially parallel and closely spaced longitudinally extending wooden planks of substantially equal length with the ends thereof aligned to define a square or rectangular configuration,

an intermediate layer of substantially parallel and closely spaced planks overlying said lower layer and extending transversely thereto,

said intermediate layer planks being of substantially equal length and extending transversely from one edge to the other of said lower layer with substantially all of the ends aligned in said square or rectangular configuration,

an upper layer of substantially parallel and closely spaced longitudinally extending wooden planks overlying said intermediate layer in parallel relation to said lower layer,

said upper layer planks being of substantially equal length with substantially all of the ends aligned with the ends of said lower layer in said square or rectangular configuration,

at least one plank of said upper layer being longitudinally offset to provide a male extension at only one end and a female recess only at the other end of said upper layer,

at least one plank of said intermediate layer being laterally offset to provide a male extension at only one edge and a female recess only at the other edge of said intermediate layer,

said upper layer having one less plank than said lower layer at one edge of thereof to expose the ends of said trans-

versely extending planks of said intermediate layer and to expose said female recesses along one edge of said mat section to permit an adjacent mat male extension to be lowered thereinto during assembly,

said layers being securely attached together at common overlapping intersections, and

said upper layer male extensions being adapted to fit and be removably secured in said upper layer female recesses on an adjacent mat and said intermediate layer male extensions being adapted to fit and be removably secured in said intermediate layer female recesses on an adjacent may by being lowered into position for assembly in an edge to edge, and end to end configuration with the edges and ends, respectively, of adjacent mats being in a straight line.

4,600,337

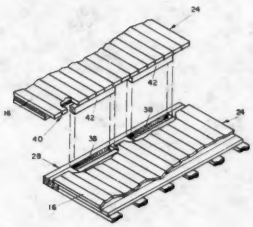
BOARD MAT SYSTEM

Ronald D. Sarver, P.O. Box 51333, Lafayette, La. 70505

Filed Oct. 31, 1983, Ser. No. 546,907

Int. Cl.[4] E01C *5/14*

U.S. Cl. 404—35 **15 Claims**



1. A temporary road comprising a plurality of mat sections, each section comprising:

a first bottom or lower layer made of substantially parallel runner members;

a second intermediate layer made of substantially parallel runner members attached in transverse relationship to the first layer runners;

a third, top or upper layer made of substantially parallel runner members attached in transverse relationship to the intermediate layer runners;

a first fastening means attached transversely to one end of the upper layer perpendicularly to the road; and

a second fastening means attached to the opposite end of the upper layer and adapted to receive in vertical relationship a respective first fastening means of a subsequent mat section.

4,600,338

MUD REMOVAL PROCESS AND APPARATUS

Albert Van Bruwaene, Lennik; Luc Neyrinck, Edegem; Luc Maertens, Louvain; Bo Verner, Antwerp, and Staffan Fors, Wilrijk, all of Belgium, assignors to De Ondernemingen S.B.B.M. and N.V. Atlas Copco Airpower Corp., both of Brussels, Belgium

Filed Jul. 6, 1983, Ser. No. 511,329

Claims priority, application Belgium, Jul. 8, 1982, 208552

Int. Cl.[4] E02B *3/02*

U.S. Cl. 405—74 **2 Claims**

1. Stationary dredging apparatus for removing sediment from the bottom of a stretch of water at a distance from a bank bounding the water without introduction or use of auxiliary water, comprising, in combination:

(a) a plurality of generally horizontal parallel suction pipes spaced apart over the bottom of the stretch of water from which said sediment is to be removed and extending laterally from said bank, each pipe having a single intake duct located at an end of said pipe remote said bank, said pipes being closed between said intake ducts and said bank;

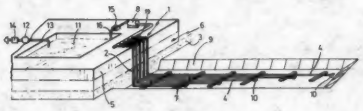
(b) a plurality of parallel substantially vertical riser pipes disposed along said bank, each pipe of said plurality being connected to a respective one of said horizontal suction pipes, for upward transfer of said sediment received from said respective horizontal suction pipe;

(c) a suction pump on said bank above said water for drawing sediment through said vertical riser pipes and said horizontal suction pipes from said intake ducts and discharging said sediment on said bank after passage through said pump;

(d) a plurality of programmably operated shut-off valves located on said bank above said water for sequentially selectably connecting individual ones of said vertical riser pipes with said suction pump to apply maximum pump suction to said connected pipe;

(e) an air compressor;

(f) vertical conduits disposed along said bank for transporting compressed air from said air compressor for injection through a lateral wall into interior juncture of respective



horizontal suction pipes and vertical riser pipes below water level, said conduits freely communicating with said interior of respective horizontal suction and vertical riser pipes at juncture thereof, so that said injected compressed air rising in said riser pipe assists upward conveyance of said sediment;

wherein when a selected one of said shut-off valves is open said suction pipe draws sediment through a respective vertical riser pipe-horizontal suction pipe combination from a respective intake duct with compressed air injected at said horizontal suction pipe-vertical riser pipe juncture interior rising in said riser pipe and aiding in upward conveyance of said sediment but when said selected one of said shut-off valves is closed said suction pump is isolated from said respective vertical riser pipe-horizontal suction pipe combination with said compressed air injected at said horizontal suction pipe-vertical riser pipe juncture interior flowing through said horizontal suction pipe and out of a respective intake duct, oppositely to the direction of flow of sediment therethrough when said suction pump is connected thereto, to clean the suction pipe and the inlet duct thereof of accumulated sediment.

4,600,339

SHIELD FOR PROTECTING A WELL HEAD AND FUNCTIONAL MODULES OF AN UNDER SEA STATION

Yvon Castel, Pau, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Jun. 26, 1984, Ser. No. 624,625

Claims priority, application France, Jun. 28, 1983, 83 10657

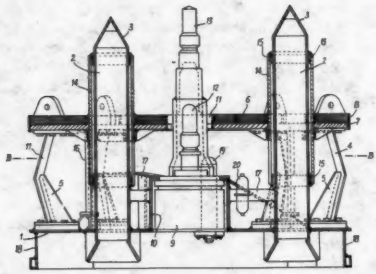
Int. Cl.[4] E02B *17/02*; E02D *31/00*

U.S. Cl. 405—211 **11 Claims**

1. In combination with a subsea installation having a well head and functional modules such as connection modules (PJU), a peripheral control and checking module (CJU) and a main control module (CSC), the installation including at least one central bearing shaft and guide columns:

a protective shield comprising a composite cushion providing a floor, said cushion including a material less dense than water and resting on a perforated metal sheet removably fixed by means of deformable feet to a horizontal plate mounted at the top of a module to be protected;

said plate having an opening at the position where the shaft of the guide column passes,



and a sleeve in said opening fixed to said plate and capable of sliding along said guide columns.

4,600,340

MINE ROOF SUPPORT UNIT

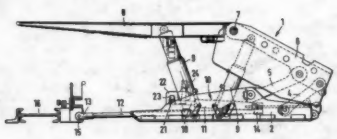
Harry Rosenberg, Lüdinghausen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 687,821

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400771

Int. Cl.[4] E21D *15/52, 23/00*

U.S. Cl. 405—297 **18 Claims**



1. A mine roof support unit including a pair of generally parallel floor girders, and an advance mechanism positioned between the floor girders, the advance mechanism comprising a hydraulic advance ram and a guide rod system, the advance ram being pivotally connected between the guide rod system and a cross member, the guide rod system being attached to an abutment means positioned adjacent to a work face, means for engaging the cross member with the floor girders in a manner permitting the floor girders to be relatively displaceable in a vertical direction, wherein each of the floor girders is provided with a repsective lifting mechanism, the arrangement being such that the lifting mechanisms can be operated to lift one of the floor girders relative to the other floor girder.

4,600,341

POCKET REDUCING INSERT FOR TOOLHOLDER AND THE LIKE

Harry B. Board, 5221 E. River Rd., Grand Island, N.Y. 14072

Continuation-in-part of Ser. No. 581,566, Feb. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 468,072, Feb. 22, 1983, abandoned. This application Feb. 12, 1985, Ser. No. 699,186

Int. Cl.[4] B26D *1/00*

U.S. Cl. 407—99 **9 Claims**

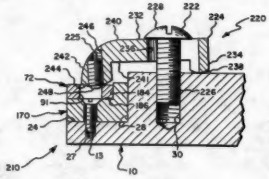
1. In combination,

a toolholder or the like of the type including a pocket designed to nestingly accept a first cutting insert of a predetermined size and shape and a clamp-accepting aperture spaced from said pocket, said toolholder pocket having a bottom and two walls which are angularly disposed to one another to nestingly accept a first cutting insert of a predetermined shape and size so that when the first cutting insert is operatively accepted by said pocket, angularly-disposed sides of the cutting insert abut said angularly-disposed walls of said pocket, said clamp-accepting aperture being internally-threaded and one wall of said pocket generally facing away from the longitudinal axis of said clamp-accepting aperture;

an adapter including a body having two sides which are angularly disposed relative to one another, being nestingly accepted within said toolholder pocket with each of said body sides in abutting engagement with a corresponding one of said pocket walls and defining a notch;

a second cutting insert having an upper face and a lower face, being nestingly accepted within said adapter notch and including a central portion defining a bore extending between said upper and lower faces; and

a clamping assembly including screw means in the form of a fastener having a head and a threaded shank extending from said head, said shank being threadably received by said clamp-accepting aperture and insert-engaging means secured to said screw means, said insert-engaging means including a top clamp having an attachment portion and an elongated finger portion extending from said attachment portion, said attachment portion defining a slotted aperture through which said fastener shank is closely received so that said attachment portion is retained between said fastener head and said toolholder, said slotted aperture permitting adjustment of the distance between said elongated finger portion and said fastener shank as said slotted aperture of said attachment portion is guidedly moved along said fastener shank, said elongated finger



portion defining a rounded surface for operatively engaging said central portion of said second cutting insert and an internally-threaded bore opening through said rounded surface, said insert-engaging means further including a set screw threadably received by said internally-threaded bore and positionable at a condition at which an end of said set screw protrudes slightly beyond said rounded surface so that when assembling said combination, said set screw and said rounded surface cooperate with said bore of said second cutting insert to locate said elongated finger portion in operative relation to said second cutting insert so that subsequent tightening of said fastener within said clamp-accepting aperture firmly presses said rounded surface against second cutting insert and generally toward said pocket bottom and said one pocket wall.

8. An adapter kit for a toolholder or the like of the type including a pocket and defining an elongated, internally-threaded clamp-accepting aperture spaced from the pocket wherein the tooholder pocket has a bottom and at least two walls which are angularly-disposed relative to one another to nestingly accept a first cutting insert of a predetermined shape and size so that when the first cutting insert is operatively accepted by the pocket, angularly-disposed sides of the first cutting insert abut the angularly-disposed walls of the tooholder pocket, one wall of said pocket generally facing away from the longitudinal axis of the clamp-accepting aperture, said kit comprising:

an adapter including a body having a bottom and at least two sides which are angularly disposed relative to one another and of such size and shape to be nestingly received within

the pocket of such toolholder with each of said body sides abutting a corresponding one of said pocket walls and defining a notch having a bottom and at least two angularly-disposed walls and of such size and shape to nestingly accept a second cutting insert having a smaller inscribed circle than that of the first cutting insert for which such toolholder is designed, at least two angularly-disposed sides and a central bore oriented generally parallel to each of its angularly-disposed sides whereby operative positioning of said second cutting insert within said body notch places the angularly-disposed sides of said second cutting insert in abutting engagement with said angularly-disposed sides of said notch to limit the directions in which said second cutting insert can be moved relative to said body; and

a clamping assembly including screw means in the form of a fastener having a head and a threaded shank extending from said head, said shank being threadably receivable by the clamp-accepting aperture and insert-engaging means securable to said screw means, said insert-engaging means including a top clamp having an attachment portion and an elongated finger portion extending from said attachment portion, said attachment portion defining a slotted aperture through which said fastener shank is closely receivable so that said attachment portion is retained between said fastener head and the toolholder when said fastener shank is threadably received by said clamp-accepting aperture, said slotted aperture permitting adjustment of the distance between said elongated finger portion and said fastener shank as said slotted aperture of said attachment portion is guidedly moved along said fastener shank, said elongated finger portion defining a rounded surface for operatively engaging said second cutting insert and an internally-threaded bore opening through said rounded surface, said insert-engaging means further including a set screw threadably received by said internally-threaded bore and positionable at a condition at which an end of said set screw protrudes slightly beyond said rounded surface so that when assembling said kit, toolholder and second cutting insert, said set screw and said rounded surface cooperate with said bore of said second cutting insert to locate said elongated finger portion in operative relation to said second cutting insert so that subsequent tightening of said fastener within said clamp-accepting aperture firmly presses said rounded surface against said second cutting insert and generally toward said pocket bottom and said one pocket wall.

4,600,342

CONTROL MEANS FOR KNEE OF METAL CUTTING APPARATUS

Gustav Dabringhaus, deceased, late of Martin County, Fla.; by Vera Dabringhaus, personal representative, 717 Redding Rd., Birmingham, Mich. 48009, and Michael A. Miller, 4605 Baldwin Rd., Metamora, Mich. 48445

Filed Apr. 30, 1984, Ser. No. 605,071
Int. Cl.[4] B23D *5/08*
U.S. Cl. 409—227 **16 Claims**

1. Control means for controlling vertical movement of the knee of a metal cutting apparatus along the "Z" axis comprising:

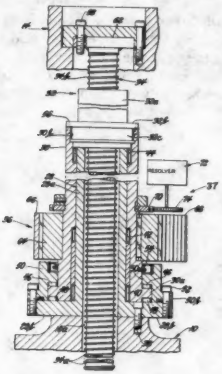
(A) a fixed, upstanding, hollow support post;

(B) a sleeve telescopically received over said post and journalled for rotation on said post;

(C) a nut member fixedly secured to the upper end of said sleeve;

(D) a lead screw member threadably received in said nut and extending downwardly from said nut within said hollow support post and upwardly from said nut for attachment to the knee; and

(E) drive means drivingly connected to said sleeve to rotate the latter and thereby said nut member to displace said



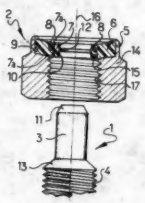
lead screw member, and thereby the knee, vertically along said "Z" axis.

4,600,343

BOLT AND ASSEMBLY USING SUCH A BOLT

Jean-Claude Frerejacques, Saint-Cosme-en-Vairais, France, assignor to Simmonds S.A., France

Filed May 14, 1984, Ser. No. 609,982
Claims priority, application France, May 20, 1983, 83 08437
Int. Cl.[4] F16B *39/34*
U.S. Cl. 411—303 **6 Claims**



1. A bolt allowing the assembly of any members or parts, comprising an externally threaded member forming a screw, a nut having an upper portion and a bearing face opposite said upper portion, said upper portion of said nut containing a self-locking washer, a ring internally concentric with said washer and separably associated therewith, and an element extending the threaded end of the screw and co-operating with said ring to axially guide the screw during its introduction into the nut.

4,600,344

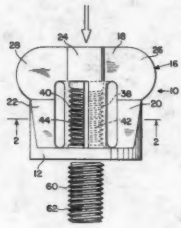
PUSH-ON PLASTIC WING-NUT FASTENER

Paul M. Sutenbach, Chicago; Brian R. Peek, Steger, and Richard F. Daubert, Tinley Park, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 5, 1983, Ser. No. 558,397
Int. Cl.[4] F16B *37/16*
U.S. Cl. 411—435 **8 Claims**

1. A wing-nut fastener of the type that can be pushed onto a threaded stud and be held in threaded engagement and that is molded into a plastic one-piece structure comprising a base having a central aperture, a U-shaped support having a head portion and a pair of leg portions, said head portion having a

central opening in axial alignment with said central aperture, said central aperture and said central opening having a diameter slightly larger than the cross dimension of a particular thread pitch, said leg portions integrally formed with said base, and a pair of thread forming members extending between said base and said head portion, each of said thread forming members having the opposite ends integrally formed with said base and said head portion and having the length of each thread forming member between said opposite ends free to flex, each



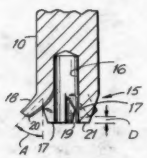
of said thread forming members having an arcuate thin wall section with internal thread surfaces which together form a plurality of screw threads matching said particular thread pitch in axial alignment with said central opening and said central aperture, where the thickness of said thin wall sections of said thread forming members is selected to permit said thin wall sections to flex radially outward a sufficient amount to permit said plurality of screw threads to ratchet over the threads of a threaded stud having said particular thread pitch when said fastener is pushed inwardly thereon.

4,600,345

IMPACT FASTENER DEVICE

Milton Hinden, Glen Head, and Charles Giannone, N. Babylon, both of N.Y., assignors to Duro-Dyne Corporation, Farmingdale, N.Y.

Filed Jan. 24, 1985, Ser. No. 694,615
Int. Cl.[4] F16B *15/04*
U.S. Cl. 411—447 **5 Claims**



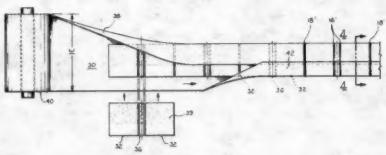
1. As a new article of manufacture, a tilt resistant impact fastener for attaching insulative material to sheet metal comprising, in combination, a cylindrical shank having a driving head at one end and a penetrating clinch assembly at the other end, said clinch assembly comprising a generally frusto-conical external wall configuration tapered inwardly toward the axis of said shank, the end portion of said clinch assembly defining an axially directd recess, said frusto-conical portion including three angularly spaced-apart slots extending axially within said configuration, said slots being spaced apart substantialy 120°, thereby to define three gripper teeth, the end portions of said gripper teeth being blunt and disposed in coplanar alignment, a stabilizer leg formed in said configuration between each pair of said teeth, said stabilizer iegs including distal portions disposed in a plane closer to said head than the plane of said gripper teeth, the inner and outer surfaces of said stabilizer legs sloping outwardly from said shank and downwardly toward the plane defined by the ends of said teeth, said stabilizer legs being positioned to be radially outwardly deflected responsive to axial pressure exerted against the distal ends thereof in the direction of said head.

4,600,346

BINDER COVER AND METHOD OF MANUFACTURE THEREOF

Edward Podosek, Wilbraham, Mass., assignor to Dennison National Company, Holyoke, Mass.

Filed Nov. 22, 1985, Ser. No. 800,788
Int. Cl.[4] B42C *7/00, 1/00;* B42D *3/00;* B31B *1/00*
U.S. Cl. 412—3 **8 Claims**



1. Multi-ply cover for binders having a back panel and rectangular front and rear cover panels with hinge lines for swinging movement of the cover panels relative to the back panel, said cover panels being defined by transverse side edges and upper and lower longitudinal edges, said cover comprising a unitary sheet of heat-sealable, thermoplastic material, a plurality of laterally spaced rectangular inserts encased between opposed layers of said unitary sheet folded about at least one of said longitudinal edges and fused together along said outer side edges and along said hinge line, said inserts being sufficiently rigid to impart form stability to said cover and being encased within said sheet material.

8. Method of fabricating a cover for binders comprising the steps of wrapping a unitary web of heat-sealable thermoplastic sheet material about a plurality of sets of laterally spaced rectangular inserts being advanced along a predetermined path, each set comprising a pair of cover panel inserts and a back panel insert, adhesively bonding said web to the opposite surfaces of said inserts to fully encase said inserts within opposed layers of said sheet material, fusing together the opposed portions of said sheet material in the areas at which the inserts are spaced apart to form sealed hinge lines and sealed side edges for each set of inserts and upon fusing said sheet material, successively serving the leading set of plastic-encased panels from the next set to form sequentially said covers.

4,600,347

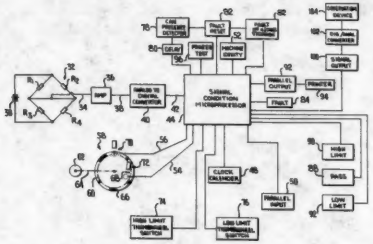
DOUBLE SEAM TIGHTNESS MONITOR

Anthony F. Segredo, Bloomingdale; Richard E. Prendergast, Western Springs; Ralph E. Martin, Oak Lawn, and Jack W. Pluister, Tinley Park, all of Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Nov. 9, 1984, Ser. No. 669,716
Int. Cl.[4] B21D *51/32*
U.S. Cl. 413—26 **21 Claims**

1. In a double seam forming mechanism for use in applying end units to can bodies, a cam including a second operation seaming cam track, said cam track having a seaming dwell portion, and said seaming dwell portion having attached thereto a strain gauge forming means for determining the pressure applied to said seaming dwell portion during a second seam forming operation as in indication of the seam tightness, said second operation seaming cam track at at least said seaming dwell portion being generally annular and having an inner

surface, said inner surface having a radially outward relief to locally reduce the wall thickness of said seaming dwell portion,



and said strain gauge being applied to said inner surface in the reduced wall thickness portion thereof.

4,600,348

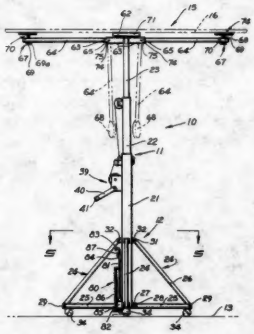
PANEL HOIST

Earl O. Pettit, P.O. Box 1271, Priest River, Id. 83856

Filed Jul. 9, 1984, Ser. No. 629,118

Int. Cl.⁴ E04G *21/14*

U.S. Cl. 414—11 **8 Claims**



1. A hoist for raising and positioning panels, comprising:

a tubular main mast piece having at least one side aperture formed therein, and a bottom end and top end;

a tubular secondary mast piece slidably received within the tubular main mast piece; the secondary mast piece having a bottom end and a top end; the secondary mast piece having at least one secondary mast sheave rotatably mounted near the bottom end;

a top mast piece slidably received within the tubular secondary mast piece; the top mast piece having a top end and a bottom end;

at least one secondary mast pulley mounted near the top end of the secondary mast; the secondary mast pulley having a top mast cable extending thereover which is connected to the main mast piece and arranged to support the top mast;

a base framework connected to the main mast piece for supporting the mast pieces in an upright position upon a supporting surface; the base framework including casters for allowing the hoist to be rollably positioned upon a supporting surface; the base framework also being adjustable between extended positions wherein the casters are extended outwardly and a contracted position wherein the base framework is collapsed against the main mast piece for compact portability;

a head assembly detachably connected to the top mast piece and having extension arms adjustable between extended positions wherein the extension arms extend outwardly and collapsed positions wherein the extension arms extend downwardly along the mast pieces; and

winch means mounted upon the main mast piece, and having a winch cable which extends beneath the secondary mast sheave and upwardly to the opposed side of the main mast piece, to lift the secondary and top mast pieces as the winch means takes up the winch cable.

4,600,349

APPARATUS FOR TRANSPORTING AND POSITIONING SHEET METAL PLATES

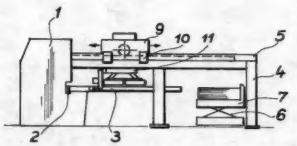
Adolf Vogt, Günzburg, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne, Günzburg/Donau, Fed. Rep. of Germany

Filed Feb. 14, 1985, Ser. No. 701,420

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1984, 3405322

Int. Cl.⁴ B65H *1/00*

U.S. Cl. 414—225 **5 Claims**



1. Apparatus for transporting and positioning sheet metal plates and the like at a sheet metal plate shearing machine including a shearing table, comprising a carrier for movably supporting the plate for movement to and from the shearing machine, a device mounted on said carrier for effecting upward and downward movement and turning movement relative to the shearing table, a gripping member secured to said device for movement therewith, said gripping member including at least one electromagnetic plate having a planar surface arranged to face the plate to be transported, said planar surface having an annular boundary edge defining the outer boundary of said surface, an annular groove formed in said planar surface adjacent to and spaced inwardly from said annular edge, an annular sealing lip positioned within and extending around said annular groove, said sealing lip protrudes outwardly from said planar surface and forms with said surface located within said sealing lip a suction space, a bore extending through said plate and opening through said planar surface to said suction space, vacuum producing equipment connected through said bore to said suction space, a switch for operating said electromagnetic plates, a control valve for operating said vacuum producing means and means for actuating said switch and control valve together.

4,600,350

METHOD AND APPARATUS FOR HANDLING CONTAINER CHASSIS

Randall W. Matthewson; Earl H. Benefiel, and Ronald A. Brudi, all of Longview, Wash., assignors to Brudi Equipment, Inc., Kelso, Wash.

Filed Dec. 27, 1982, Ser. No. 453,287

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.⁴ B66F *9/18*

U.S. Cl. 414—267 **16 Claims**

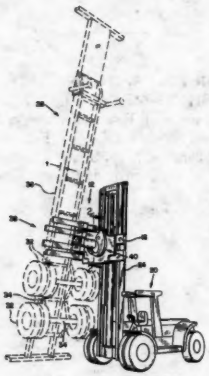
2. A method of storing an unloaded container chassis having a thin, elongate and wide frame and a wheel assembly mounted to a rear portion of said frame, the method comprising:

approaching said container chassis from one side;

clamping from one side opposing top and bottom surfaces of said container chassis forwardly of said wheel assembly;

lifting said chassis from a supporting surface to a height such that said chassis can be freely rotated;

rotating said chassis about a horizontal axis passing transversely through said chassis frame forwardly of the wheel



assembly from a generally horizontal position to a generally vertical position; and

inserting the generally vertical chassis sideways into a side-opening storage stall for storage in such position.

4,600,351

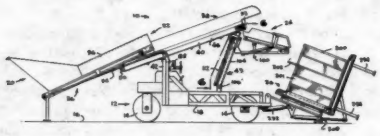
FOWL METERING AND COOPING SYSTEM

Glenn S. Nelson, Fayetteville, Ark., assignor to Board of Trustees University of Arkansas, Fayetteville, Ark.

Filed Jun. 28, 1983, Ser. No. 509,221

Int. Cl.[4] A01K *29/00*

U.S. Cl. 414—331 **20 Claims**



1. A fowl cooping apparatus comprising:

a support frame;

movable infeed hopper means mounted on said support frame and selectively positionable in a desired location adjacent ground level for receiving fowl to be harvested;

coop unit supporting means mounted on said support frame;

a coop unit including a plurality of coop compartments in a vertical and horizontal array mounted on said coop unit supporting means;

fowl receiving and holding means mounted on said support frame;

power driven conveyor means for conveying fowl from said infeed hopper means to said fowl receiving and holding means;

discharge means for discharging fowl from said fowl receiving and holding means into any selected one of said coop compartments; and

interruption means for deactivating said conveyor means in response to the positioning of a predetermined weight of fowl in said fowl receiving and holding means.

4,600,352

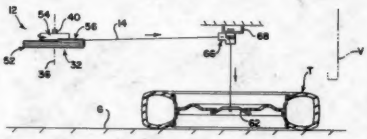
SPARE TIRE HANDLING MECHANISM

Steve D. Ivan, St. Clair Shores, Mich., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jul. 18, 1984, Ser. No. 631,821

Int. Cl.[4] B62D *43/04*

U.S. Cl. 414—463 **9 Claims**



1. In a spare tire handling mechanism of the character mounted on a vehicle for displacing a spare tire between stored and accessible positions relative to the vehicle and comprising rotatable drum means and cable means attached at one end to said drum means and having other end means detachably engagable with a spare tire, whereby said tire is displaceable from said accessible to said stored position in response to rotation of said drum means in one direction and from said stored to said accessible position in response to rotation of said drum means in the direction opposite said one direction, the improvement comprising: said drum means having axially adjacent first and second drum portions onto which said cable means is sequentially wound, first onto the first portion then onto the second portion, in response to rotation of said drum means in said one direction, said first drum portion having a larger diameter than said second drum portion, and the load on said cable means by said spare tire being greater during winding of said cable means on said second portion than during winding of said cable means on said first portion.

4,600,353

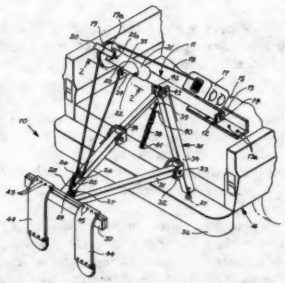
WRECKER ASSEMBLY

Harley E. Phillips, Jr., 924 E. 4th St., Mishawaka, Ind. 46544

Filed Nov. 27, 1984, Ser. No. 675,440

Int. Cl.[4] B60P *3/12*

U.S. Cl. 414—563 **1 Claim**



1. A wrecker assembly, comprising, in combination, an automotive towing vehicle, a horizontal flat bed upon the rear of said vehicle, a bracket mounted upon said flat bed having a pair of spaced apart upwardly projections, a lower end of an upwardly rearward inclined boom fixedly secured between said projections, an "A"-frame fastened upon a rear bumper of said vehicle, a chain secured between an upper apex of said "A"-frame and a rear end of said bed, a longitudinally intermediate portion of said boom being fastened upon said "A"-frame apex, a boom head received upon an upper end of said boom, means for limited pivotable rotation of said boom head on said

boom and means for extendability thereof on said boom, said both means comprising a pin projecting from the side of said boom being slidable in a slot unit along said boom head, said slot unit comprising a longitudinal slot connected to one end of a plurality of spaced apart transverse slots, and an upwardly "T"-shaped slot on an opposite end of each said transverse slot, said "A"-frame comprising a pair of upwardly converging legs, a rearwardly arm pivotally supported by its one end to a longitudinally intermediate portion of each one of said legs, a transverse cross-bar affixed to opposite end of said arms, a pair of straps affixed on opposite ends of said cross-bar, a winch mounted upon said lower end of said boom, a rotatable pulley around a transverse pin on said boom head, and one end of a cable from said winch extending across said pulley and supporting said cross-bar.

4,600,354

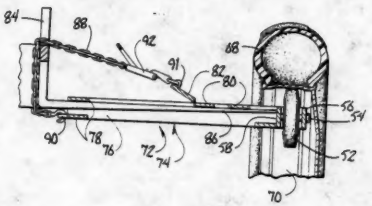
MULTIPLE-USE UTILITY JACK AND TIRE CHANGING TOOL

Jack L. Niewald, P.O. Box 224, Clinton St., and Eugene W. Kelch, R.R., both of Corwith, Iowa 50430

Continuation-in-part of Ser. No. 579,349, Feb. 13, 1984. This application Jul. 27, 1984, Ser. No. 635,241

Int. Cl.[4] B66F *9/12*

U.S. Cl. 414—607 **14 Claims**



1. A load handling attachment for lifting, supporting, lowering and transporting a vehicle tire having a rim, said attachment being readily removeably securable to and operable from an external motive and lifting means, comprising:

a framework having a top and bottom, and front, back, left and right sides;

a vehicle tire rim contacting and supporting means attached to said front of said framework comprising tandem rotatable wheels aligned in the same vertical plane and having rotational axes parallel to one another in the same horizontal plane, said wheels being horizontally spaced-apart but being located close together so as to be able to be placed within the recess of the tire rim so as to rollingly support the tire rim thereon, said tandem wheels being contactable with the interior of said rim of said vehicle tire to support said tire while allowing rotation of said tire;

a means for readily removably mounting said framework upon said external motive and lifting means; and

a means for removably securing said framework to said external motive and lifting means.

4,600,355

MODULAR ROBOTICS SYSTEM WITH BASIC INTERCHANGEABLE PARTS

Roger F. Johnson, Kent, Wash., assignor to Cybot, Inc., Kirkland, Wash.

Filed Aug. 29, 1984, Ser. No. 646,320

Int. Cl.[4] B25J *9/08*

U.S. Cl. 414—680 **17 Claims**

1. A modular, multi-configuration, educational robotics system having basic interchangeable component parts, comprising:

support surface means having a predetermined pattern and spacing of threaded holes therein;

an elongated modular rail means having a generally rectangular cross-section and including a substantially flat bottom mounting surface and a substantially flat top mounting surface, said top mounting surface extending over a shorter portion of said rail length than said bottom mounting surface and being centrally disposed so as to define fastening areas at the ends thereof for securing said rail means to said support surfaces means and further including attachment openings at predetermined locations thereon so that other rail means or other modular components may be secured to said top and bottom mounting surfaces;

a modular mounting block means which is a generally rectangularly shaped body having upper and lower mounting edges and side mounting edges and including opposed first and second surfaces, said body including a centrally disposed opening between said opposed first and second surfaces and further including a mounting slot opening located on each side of said centrally disposed opening, said mounting slot openings being generally parallel and extending over a predetermined portion of said body at right angles to said upper and lower mounting edges, said body further including threaded hole means at predetermined locations thereon for receiving securing means to attach the same to other component parts of said system;

modular first arm link means mounted for pivotal movement by one end on a shaft means supported between a pair of said block means and a modular second arm link means mounted for pivotal movement at the outer end of said first arm link means and adapted to receive an end effector means at its outer end; and

power and drive transmission means at least partially attached to mounting block means on said support surface means for causing pivotal movement of said first and second arm links and predetermined types of movement to said end effector and including electronic controller means therefor.

4,600,356

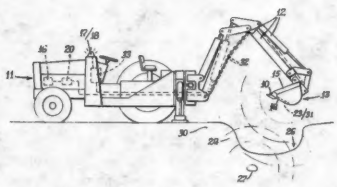
UNDERGROUND PIPELINE AND CABLE DETECTOR AND PROCESS

Jack E. Bridges, Park Ridge; Robert J. Sutkowski, Chicago, and Kenneth E. Hofer, Jr., Chicago Ridge, all of Ill., assignors to Gas Research Institute, Chicago, Ill.

Filed Jan. 27, 1984, Ser. No. 574,568

Int. Cl.[4] E02D *17/00*

U.S. Cl. 414—694 **10 Claims**



1. An apparatus capable of making excavation in the ground in combination with a fully contained underground elongated conductive object detector comprising:

a transmit and receive means capable of locating an underground elongated conductive object in the proximity of said excavation mounted in a digging implement comprising a metal bucket, said transmit and receive means installed on the inside of the digging face of said bucket, said digging face having a multiplicity of through slots covered with non-conducting material in the vicinity of said transmit and receive means, and the edges of a heavy metal entry face frame having multiple interruption slots reducing the time value decay constants of induced eddy currents;

means for providing an electric pulse signal to said transmit

means, said transmit means capable of transmitting a pulsed magnetic transmit field outwardly through the ground in the direction of said excavation;

said receive means capable of receiving eddy currents induced by said underground conductive object contacted by said pulsed magnetic transmit field and transmitting an electrical signal proportionate to said eddy currents;

said pulsed magnetic transmit field having decay times substantially less than said eddy current decay time;

means for electronically processing said eddy current electrical signal to determine the presence of said underground conductive object.

4,600,357

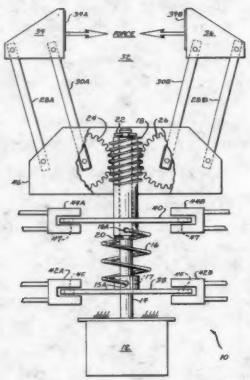
GRIPPER FORCE SENSOR/CONTROLLER FOR ROBOTIC ARM

Russell G. Coules, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Feb. 21, 1984, Ser. No. 582,200

Int. Cl.[4] B25J *15/02*

U.S. Cl. 414—730 **17 Claims**



1. In a robotic arm, apparatus for measuring the gripping force applied by said arm upon an object grasped therein, said apparatus comprising:

drive means having a rotating shaft;

flexible coupling means connected to said rotating shaft;

rotary displacement means positioned upon and supported by said rotating shaft and freely rotatable with respect to said rotating shaft, said rotary displacement further connected to said flexible coupling means so as to rotate in response to displacement of said rotating shaft;

gripper means coupled to said rotary displacement means and responsive to rotation thereof for engaging an object in a grasping manner; and

sensor means coupled to said rotating shaft and to said rotary displacement means for measuring the difference between their respective angular displacements for deriving the force applied by said gripper means upon said object and for measuring an increase in the gripping force when said rotating shaft is displaced in a first direction of rotation and a decrease in the gripping force when said rotating shaft is displaced in a second direction of rotation.

4,600,358

MANIPULATING DEVICE OPERATING IN TWO DIRECTIONS

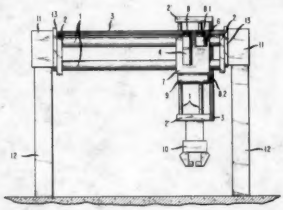
Bernhard Graf, Plochingen, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft z.Förd.der angew. Forschung, Munich, Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 494,775

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218712

Int. Cl.[4] B66C *13/08;* **B25J** *13/00;* **B23Q** *7/04*

U.S. Cl. 414—749 **23 Claims**



1. Two directional manipulating device for the moving of work pieces between desired positions

within a plane comprising support means;

a first support bar mounted to the support means;

a first gear rack mounted to the support means and running about parallel to the first support bar;

a carriage disposed on the first support bar by having a guide track surrounding the first support bar over a certain length;

a first drive unit attached to the carriage and comprising

a first drive motor, and

a first pinion attached to the first drive motor and having its axis parallel to the axis of the first drive motor and engaging the first gear rack;

a sensor pinion engaging the same rack;

a first rotary pulse generator mounted on the carriage and the sensor pinion axis being parallel to the axis of the first rotary pulse generator, where the first rotary pulse generator is spacially separated from the first drive unit and comprising a prestressed first sensor pinion engaging the first gear rack;

a second support bar guided at the carriage by a guide track in the carriage surrounding the second support bar over a certain length;

an end plate attached to the end of the second support bar;

a second gear rack mounted to the end plate and running about parallel to the first support bar;

a second drive unit attached to the carriage and comprising

a second drive motor, and

a second pinion attached to the second drive motor and engaging the second gear rack;

a second pulse generator mounted on the carriage spacially separated from the second drive unit and comprising a prestressed second sensor pinion engaging the second gear rack; and

engagement means attached to the end plate for engaging the work piece.

4,600,359

INDEXING METHOD AND APPARATUS

Thomas G. Zemek, Mansfield Depot, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 24, 1984, Ser. No. 686,312

Int. Cl.[4] B25J *19/02*

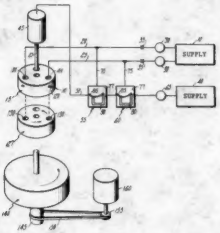
U.S. Cl. 414—754 **10 Claims**

5. Apparatus for indexing a shaped component, said apparatus comprising:

at least one pneumatic supply duct;

at least one pneumatic vent duct;

a head disposing said pneumatic supply and vent ducts proximally to one another and to said shaped component such that corresponding supply and vent ducts are blocked from one another by said component in an unindexed position thereof and placed in communication with one another by the shape of said component in an indexed position thereof;



means sensing the pressure within at least one of said supply and vent ducts;

means adjusting the position of said component; and

means responsive to said pressure sensing means for terminating adjustment of said component part in its indexed position when the pressure in said one duct reaches a predetermined level indicating a predetermined extent of communication between said supply and vent ducts and therefore an indexed position of said component.

4,600,360

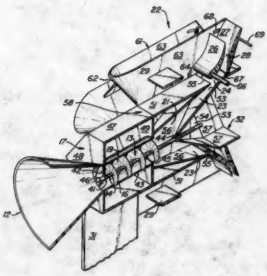
WIND DRIVEN TURBINE GENERATOR

Edward A. Quarterman, 2284 Evans St., Livermore, Calif. 94550

Filed Jun. 25, 1984, Ser. No. 624,342

Int. Cl.[4] F03D *1/04, 7/02*

U.S. Cl. 415—2 A **10 Claims**



1. An improved wind driven turbine generator including turbine blades disposed in a turbine housing and mounted on a rotatably mounted turbine shaft wherein said turbine housing defines an air inlet opening and an air discharge opening whereby air passing from said inlet opening to said discharge opening impinges on said turbine blades causing said shaft to rotate, the improvement comprising:

a low pressure chamber disposed to receive air from the discharge opening of said turbine housing, said low pressure chamber defining a plurality of discharge ports; and

an airfoil mounted adjacent to at least one of said discharge ports where the longer air path of said airfoil is closest to said port whereby wind passing around said airfoil reduces the pressure at said port.

4,600,361

SELECTIVELY CONTROLLED DUAL DELIVERY PUMP, PARTICULARLY FOR MOTOR VEHICLE APPLICATION

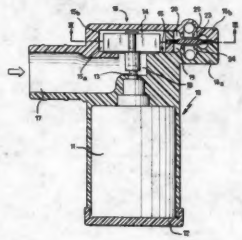
Carlo Bianco, Lugano, Switzerland, assignor to Strada Cantonale, Stabio, Switzerland

Filed May 29, 1984, Ser. No. 614,831

Claims priority, application Italy, Jun. 8, 1983, 67628 A/83

Int. Cl.[4] F04D *29/50*

U.S. Cl. 415—146 **8 Claims**



1. A selectively controlled dual delivery pump, particularly for motor vehicle application, comprising a stator casing, an impeller housing within said stator casing, a bidirectional rotating pump impeller within said impeller housing, a manifold room within said stator casing, shutter means in said manifold room, said shutter means defining and hermetically sealing from each other a first and a second manifold chambers in said manifold room, two separate communication conduits extending tangentially from said impeller housing and opening at either said manifold chambers so as to divert a fluid flowing in said impeller housing tangentially to said pump impeller with respect to both rotation directions of said pump impeller, a delivery outlet in each said manifold chamber, a separate delivery manifold departing from each said delivery outlet, a valve seat at said delivery outlet in each manifold chamber in front of said shutter means, said shutter means comprising an elastic membrane for selectively shutting off said valve seats, thereby the rotation direction of said pump impeller causes a high pressure condition in one manifold chamber and a low pressure condition in the other manifold chamber so that the elastic membrane is pushed against and cuts off the valve seat in the manifold chamber at the low pressue condition and shuts off flow in the delivery manifold departing therefrom.

4,600,362

IMPELLER FOR AXIAL FAN WITH BLADE LOCKING MEANS

A. G. Vostermans, and H. L. Vostermans, both of Venlo, Netherlands, assignors to A.G. Vostermans B.V., Netherlands

Filed Nov. 21, 1984, Ser. No. 673,923

Claims priority, application Netherlands, Dec. 21, 1983, 8304378

Int. Cl.[4] F01D *5/32*

U.S. Cl. 416—208 **2 Claims**

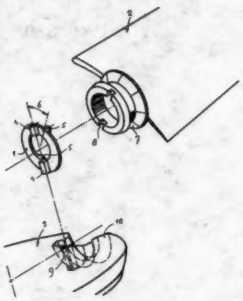
1. An impeller for an axial fan, said impeller comprising a hub transversally split into two parts each defining recesses into which root portions of a pluraity of impeller blades are inserted and locked when the two parts are joined together, said impeller further comprising a ring shaped key-piece of substantially the same exteral diameter as the end surface of the root portion of each blade in each of said recesses to prevent rotation of the root portion of each blade in its corresponding recess,

the end surface of the root portion of each blade having two diametrically opposite recesses of the same size, said recesses being located adjacent to the periphery of said end surface;

the surface of each recess defined in the hub, which surface

is opposite to the end surface of the root portion of the corresponding blade, having two diametrically opposite recesses of the same size as the recesses in the end surface of said root portion; and

each of the key-pieces having two sides each provided with two equally shaped projections respectively located and



positioned to engage the recesses provided in the end surface of the root portion of each blade and in the opposite surface of each recess defined in the hub to positively lock the blade with respect to the hub, the projections on one side of each key-piece being circumferentially located at an angle wih respect to the projections on the other side of said key-piece.

4,600,363

EJECTOR PUMP HAVING AN ELECTROMAGNETIC MOTIVE FLUID VALVE

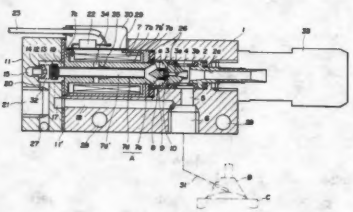
Yoji Ise, and Masakichi Kawada, both of Tokyo, Japan, assignors to Myotoku, Ltd., Tokyo, Japan

Filed Feb. 11, 1985, Ser. No. 700,560

Claims priority, application Japan, Feb. 21, 1984, 59-31085

Int. Cl.[4] F04F *5/48*

U.S. Cl. 417—187 **3 Claims**



1. An air ejector pump comprising, a pump body having an elongate bore and suction port open to a side thereof, a nozzle in said bore having a nozzle opening, an air ejector in said bore spaced from the nozzle defining therebetween a suction chamber, said air ejector having an air passage in communication with said suction chamber and the exterior of the pump body aligned with said nozzle opening, means defining a communication passage between the suction chamber and the suction port, an electromagnetic valve in said elongate bore having a plunger axially displaceable in said bore and a solenoid surrounding said plunger, the electromagnetic valve plunger having an axial passage for flow of air therethrough and a valve member on a leading end portion of the plunger for closing and opening said nozzle opening when the electromagnetic valve is energized in dependence upon whether the nozzle opening is opened or closed by the valve member on the leading end portion of the plunger when the electromagnetic valve is in a deenergized state, means biasing the plunger to close the nozzle opening, said plunger having said passage in communication with said suction chamber, the pump body having an air inlet port for supplying of air under pressure into said axial passage of the electromagnetic valve, means defining an air chamber in communication with the inlet port and the axial passage, an outlet port in said air chamber opened and closed by the electromagnetic valve to allow entry of compressed air into said suction port when open and to isolate the air chamber from the suction port when closed, a valve element mounted on the electromagnetic valve for opening and closing the air outlet port, said solenoid energizing the electromagnetic valve to position it to establish communication through said axial passage between the inlet port for air under pressure and the air ejector opening to thereby apply a suction at the suction port and to close the outlet port.

4,600,364

FLUID OPERATED PUMP DISPLACEMENT CONTROL SYSTEM

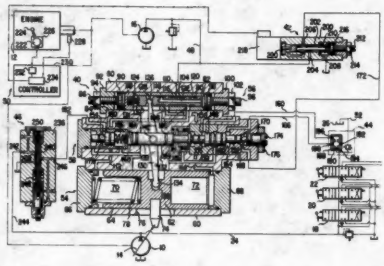
Tohru Nakatani, Kawasaki, and Teruo Akiyama, Yokohama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,555

Claims priority, application Japan, Jun. 20, 1983, 58-109208; Jun. 20, 1983, 58-109209; Jun. 20, 1983, 58-93254[U]

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—216 **3 Claims**



1. A fluid operated pump displacement control system comprising:

(a) a prime mover having a plurality of output conditions having difference output torque characteristics;

(b) at least one variable displacement pump driven by the prime mover for supplying fluid under pressure to actuator means;

(c) a fixed displacement pump;

(d) a servomechanism comprising:

(1) a servoactuator section operatively coupled to the variable displacement pump for varying the per cycle displacement thereof in response to fluid pressure from the fixed displacement pump, said servomechanism further including:

(a) a housing; and

(b) a servopiston in said servoactuator section slidably mounted in said housing so as to define a pair of opposed fluid chambers and operatively coupled to the variable displacement pump for varying the displacement thereof;

(2) a servovalve section for controlling communication between the fixed displacement pump and the servoactuator section of the servomechanism, a servovalve spool slidably mounted in said housing for placing said fixed displacement pump in and out of communication with a selected one of the fluid chambers on the opposite sides of said servopiston; and

(3) a control section operated by fluid pressure for con-

trollably actuating the servovalve section, said control section including control piston means mounted in said housing for sliding motion in response to fluid pressure actuation under the control of the torque control valve; and a control lever having a pair of opposite ends operatively engaged with said servopiston and with said servovalve spool and medially pivoted to said control piston means for moving said servovalve spool in response to the movement of said control piston means in order to cause displacement of said servopiston in a manner controlled in accordance with the movement of said control piston means;

(4) the servoactuator section, servovalve section and control section of the servomechanism being further structurally and functionally interrelated so that the controlled fluid pressure actuation of the control section results in a controlled change in the displacement of the variable displacement pump;

(e) a torque control valve for controllably actuating the control section of the servomechanism by fluid pressure from the fixed displacement pump in order to correspondingly vary the displacement, and therefore the torque requirement, of the variable displacement pump; and

(f) control means for sensing the output condition in which the prime mover operates and for actuating the torque control valve so as to cause the same to control the torque requirement of the variable displacement pump in accordance with the sensed output condition of the prime mover, thereby making it possible to make utmost use of the output torque of the prime mover in the entire speed range thereof.

4,600,365

DISPLACEMENT PUMP FOR LOW-PULSATION DELIVERY OF A LIQUID

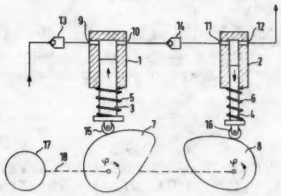
Hansjürgen Riggenmann, Munich, Fed. Rep. of Germany, assignor to Gynkotek Gesellschaft fur den Bau wissenschaftlich technischer Gerate m.b.H., Fed. Rep. of Germany

Continuation of Ser. No. 463,806, Feb. 4, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,050

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203772

Int. Cl.[4] **F04B** *9/08, 25/00*

U.S. Cl. 417—246 **6 Claims**



1. A displacement pump for low-pulsation delivery of a liquid, comprising:

first piston pump means for receiving and delivering said liquid;

second piston pump means connected to said first pump means for receiving said liquid from said first pump means and delivering said liquid;

first cam means operatively associated with said first pump means for operating the piston of said first pump means in a suction phase, a delivery phase, and transition phases between said suction and delivery phases;

second cam means operatively associated with said second pump means for operating the piston of said second pump means in a suction phase, a delivery phase, and transition phases between said suction and delivery phases; and

cam drive means for driving said first and second cam means at a constant speed with said cam means operating one of said first and second pump means in its suction phase while operating the other of said first and second pump means in its delivery phase;

said first cam means operating said first pump means in a first transition phase preceding its delivery phase substantially longer than a second transition phase prior to its suction phase and said second cam means operating said second pump means in a first transition phase prior to its suction phase substantially longer than a second transition phase prior to its delivery phase with said first transition phases of said first and second pump means being substantially equal;

said first cam means being so shaped as to increase the piston velocity of said first pump means during the said first transition phase at a rate which is substantially lower than the velocity decreasing rate of the said piston during said second transition phase of the first pump means

whereby the interruption of delivery of said liquid due to compression of said liquid at the beginning of said first transition phase of said first pump means creates a pulse having an amplitude which is at most equal to a predetermined minimum acceptable pulsation value.

4,600,366

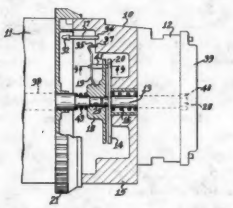
FEED RATE CONTROL FOR PERISTALTIC PUMP

Gustav H. Stenner, 10708 Executive Dr., Jacksonville, Fla. 32225

Filed Oct. 10, 1985, Ser. No. 786,289

Int. Cl.[4] **F04B** *9/00;* **F16H** *27/06, 27/10*

U.S. Cl. 417—319 **12 Claims**

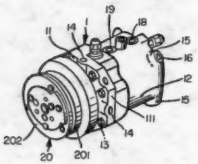


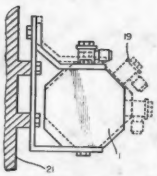
1. In a feed rate control apparatus for a peristaltic pump including a main shaft, an index plate mounted on the main shaft, a spring biased pawl adapted to intermittently engage and disengage one of a plurality of holes in said plate as a follower moves over a variable cam surface, the improvement which comprises said index plate having a central D-shaped hole for slideable engagement with an end portion of said main shaft having a complemental D-shaped cross-section, said main shaft having a central portion of larger diameter than that of said end portion to form a shoulder at the junction of said end and central portions, said end portion at said shoulder having a slot substantially the width of said plate with its bottom surface at an angle of about 45° from the flat surface of said D-shaped cross-section of said end portion, the thickness of said main shaft measured along the diameter perpendicular to said flat side of said D-shaped cross-section being substantially equal to the thickness measured along the diameter perpendicular to the bottom surface of said slot.

4,600,367
REFRIGERANT COMPRESSOR FOR AUTOMOBILE AIR-CONDITIONING SYSTEM

Kiyoshi Terauchi, Isesaki; Yasuhiro Kubo, Azumamura, and Masaharu Hiraga, Honjyo, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 319,903, Nov. 10, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,209
Claims priority, application Japan, Nov. 10, 1980, 55-158369
Int. Cl.[4] F04B *35/06*; B60H *1/32*
U.S. Cl. 417—360 **5 Claims**





1. in a refrigerant compressor for an automobile air-conditioning system, a housing comprising a front end plate member and a separate casing removably connected to an end surface of said front end plate member, a fluid inlet port and a fluid outlet port being formed at fixed locations on said casing, means for adjusting the mounting angle of said compressor to accommodate the connection of said fluid inlet and outlet ports to the air-condition system in various engine compartments, said adjusting means including a polygonal shaped mounting portion with a plurality of first tapped holes and a plurality of second tapped holes, said polygonal shaped mounting portion being formed on one of said front end plate member and said casing and having more than five outwardly facing flat faces each disposed along a different plane, one of said first tapped holes being formed in each of said faces, the other of said front end plate member and said casing having said plurality of second tapped holes to be aligned with the tapped holes formed in said faces whereby the mounting angle of the compressor can be easily adjusted by the rotation of said compressor to rotatively position said faces and said ports.

4,600,368
PRESSURE ACTUATED DOWNHOLE PUMP

Gordon M. Sommer, Boca Raton, Fla., assignor to Sommer Co., Warren, Mich.

Filed May 16, 1985, Ser. No. 735,172
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—378 **7 Claims**

2. A downhole pump for pumping a production fluid from a well hole comprising:

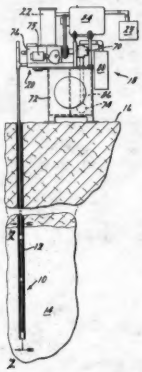
collection means communicating with said well hole for receiving said production fluid as it is pumped;

a downhole pumping means disposed within said well hole for generally vertical reciprocation therein and operable upon reciprocation to draw said production fluid from said well on the upstroke thereof and to expel said production fluid into said collection means on the downstroke thereof;

actuating means for causing said reciprocation of said pumping means by cyclically pressurizing said production fluid to cause said upstroke comprising an actuating cylinder disposed above said well hole and a piston reciprocable within said cylinder, said piston defining within said actuating cylinder a first fluid chamber and a second fluid chamber, said second chamber being coupled to communicate with said well hole and receptive of said production fluid;

a supply of hydraulic fluid maintained separate from said production fluid and maintained entirely externally from said well hole and at least partially contained within said first fluid chamber; and

pressure generating means communicating with said first fluid chamber for cyclically altering the pressure of said



hydraulic fluid within said first fluid chamber between a high pressure state and a low pressure state;

wherein said piston is responsive to said high and low pressure states within said first chamber to subject said production fluid within said second chamber and within said well hole to corresponding high and low pressure states;

wherein said pumping means is responsive to said high pressure state of said production fluid within said well hole to overcome gravitational forces and to effect said upstroke; and

wherein said pumping means is permitted during said low pressure state of said production fluid within said well hole to effect said downstroke in response to gravitational forces.

4,600,369
POSITIVE DISPLACEMENT SCROLL TYPE APPARATUS WITH FLUID PRESSURE BIASING THE SCROLL

Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sep. 11, 1985, Ser. No. 774,708
Int. Cl.[4] F01C *1/04, 19/00*
U.S. Cl. 418—55 **9 Claims**

1. Positive displacement scroll type apparatus comprising:

first and second scrolls having an interface including interfitting spiral vanes adapted to define movable pockets that travel along said interface;

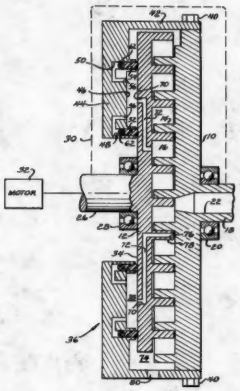
radially spaced ports in said scrolls extending to said interface;

means journalling both of said scrolls for rotation and linking said scrolls for relative orbiting movement;

means for rotating said scrolls and causing said relative orbiting movement so that said pockets travel between said ports;

one of said scrolls having a pressure responsive surface oppositely of said interface;

a chamber defining element carried by the other of said scrolls and together with said surface defining a generally sealed cavity oppositely of said interface; and



an inlet to said cavity for receipt of a fluid under elevated pressure to act against said surface in opposition to pressurized fluid at said interface.

4,600,370

APPARATUS FOR CARRYING UNVULCANIZED PNEUMATIC TIRES IN TIRE VULCANIZER

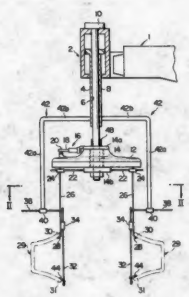
Shigeru Kaneko; Yoshiaki Hirata, and Yoshio Nohara, all of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,854

Claims priority, application Japan, Jun. 12, 1984, 59-121107; Jun. 12, 1984, 59-121108

Int. Cl.[4] B29H *5/02*

U.S. Cl. 425—38 **9 Claims**



1. An apparatus for carrying unvulcanized pneumatic tires in a tire vulcanizer, comprising:

a plurality of upper arcuate segments disposed substantially within a cylindrical surface, each of the upper arcuate segment having at its lower end an upper bead support end for supporting an upper bead portion of the unvulcanized pneumatic tire;

said upper arcuate segments as a whole being expandable and contractable radially inward and outward;

said upper arcuate segments as a whole being turnable horizontally and movable upward and downward; and

a plurality of lower arcuate segments disposed within said upper arcuate segments, each lower arcuate segment having rotatably mounted at its lower end a lower bead support member for supporting a lower bead portion of the unvulcanized pneumatic tire and being movably supported by the corresponding upper arcuate segment;

said lower arcuate segments as a whole being expandable and contractable radially inward and outward together with said upper arcuate segments;

said lower arcuate segments as a whole being turnable horizontally and movable upward and downward together with said upper arcuate segments;

each of said upper and lower arcuate segments being movable toward and away from with each other and overlapped with each other when moved toward each other.

4,600,371

APPARATUS FOR FITTING AND CENTERING THERMOPLASTIC SHEATH AROUND OBJECTS BY MEANS OF A VERTICAL UNIT WITH A FLOATING MANDREL

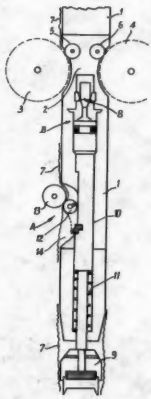
Jacques Fresnel, 15 Boulevard Lannes, 75116 Paris, France

Filed Jun. 30, 1982, Ser. No. 393,637

Claims priority, application France, Jul. 1, 1981, 81 12924

Int. Cl.[4] B65B *9/10*; B29C *61/02*

U.S. Cl. 425—110 **9 Claims**



1. In an apparatus for fitting and centering a sheath such as a thermoplastic sleeve or the like about an object and comprising a vertically floating mandrel about which the sheath is fed downwardly toward the object, and in which said mandrel is provided with a hollow passage in the lower portion thereof to receive a normally vertically movable member, said vertically movable member carrying at the normally lower end thereof a mold member adapted to engage the head of the object which is to be sheathed, whereby to guide and center the transfer of said sheath to said object, in which the improvement comprises providing a recess in said mandrel opening inwardly from the exterior periphery of said mandrel and into communication with said hollow passage, providing a first element lying in said recess and connected to said vertically movable member, whereby movement imparted to said first element causes movement of said vertically movable member, a second element, a drive means located exteriorly of said mandrel for driving said second element, said drive means being operable to move said second element from a location exterior of said mandrel into engagement with said first element, and for subsequently moving said second element while in engagement with

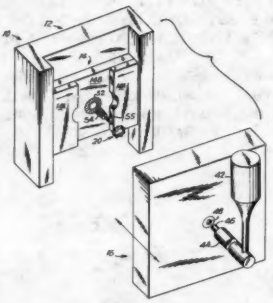
said first element to cause lowering movement of said vertically movable member and of said mold member carried by said vertically movable member from an initial elevated position, whereby to cause said mold member to engage the head of the object which is to be sheathed.

4,600,372

POSITIONING SYSTEM FOR MOLDING PLASTIC DRIVE GEAR

Victor Barouh, 11 Wheatley Rd., and Seth Dinsky, 4 Deepwood Ct., both of Old Westbury, N.Y. 11568

Filed Aug. 20, 1985, Ser. No. 767,591
Int. Cl.[4] B29F *1/10*; B29C *1/00*
U.S. Cl. 425—128 14 Claims



1. An improved system for molding a plastic drive gear member having a gear member having gear teeth tilted toward the direction of rotation of said drive gear member, comprising, in combination,

a source of hot liquid plastic,

a mold having core means and cavity means,

said core means being for shaping one portion of said drive gear member,

said cavity means being associated with said core means and being for combining with said core means for shaping the other portion of said drive gear member and for receiving said liquid plastic from said source of hot liquid plastic and for passing said hot liquid plastic to said core means during the molding of said drive gear member upon activation of said cavity means to combine with said core means,

delivery means for passing said hot liquid plastic from said source to said cavity means upon activation of said cavity means,

power means for driving said cavity means,

said gear member having an inner rim forming a hole,

said core means including a core pin adapted to mount said gear member in close relationship at said gear inner rim in non-rotatable alignment,

first alignment means including a plurality of keyways formed in and oriented asymetrically on said core pin, and

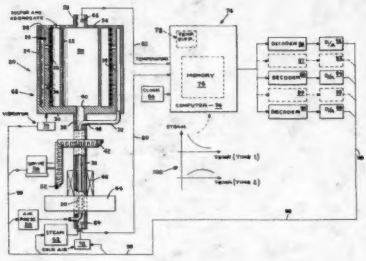
second alignment means including a plurality of keys formed on and oriented asymetrically on said gear member cooperating with said plurality of keyways during the mounting of said gear member around said core pin, said first and second alignment means being for aligning said gear member with said core member so that said gear teeth can be tilted only toward the direction of rotation of said drive gear member when said drive gear member is mounted in said cassette.

4,600,373

CONCRETE PIPE MACHINE

Harold V. Swanson, Sparta, N.J., assignor to GHA Lock Joint, Inc., Parsippany, N.J.

Filed Mar. 11, 1982, Ser. No. 357,196
Int. Cl.[4] B28B *21/34, 21/78*
U.S. Cl. 425—144 8 Claims



1. A pipe fabrication machine comprising in combination:

centrifuging means for imparting a pipe shape to a mixture of sulfur cement and aggregate,

heating means coupled to said centrifuging means for heating said mixture, said heating means directing heat through said centrifuging means, said centrifuging means having an open central region and a hollow shaft for guiding said heat therethrough during rotation of a drum of said centrifuging means,

sensing means for sensing inlet temperature and outlet temperature of said heat while it is propagating through said centrifuging means, and

computing means coupled to said sensing means for computing the present temperature of said mixture in said centrifuging means based on the difference between said inlet temperature and said outlet temperature, said computing means including a memory, said memory storing a predetermined relationship between the present temperature and a desired temperature of said mixture as a function of time, said memory outputting the desired temperature upon being addressed with the present temperature and time by said computing means, and wherein

said heating means is connected to said computing means, said heating means being responsive to the desired temperature outputted by said memory for adjusting the flow of said heat to provide said desired temperature to said mixture in accordance with said stored relationship.

4,600,374

MACHINE FOR MOLDING ARTICLES BY INJECTION MOLDING OR DIE CASTING

Werner Brugger, Niederuzwil, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Filed Apr. 18, 1985, Ser. No. 724,614
Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417293
Int. Cl.[4] B29F *1/06*
U.S. Cl. 425—149 19 Claims

1. Apparatus for molding articles from a molding material, comprising:

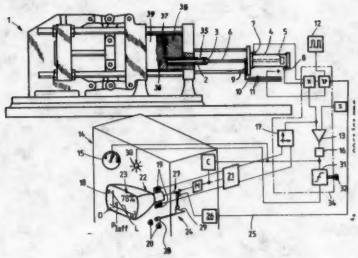
mold means defining a cavity and having an predetermined characteristic to be expressed in a diagram as a mold resistance line;

injection sleeve means of hollow cross-section and a predetermined maximum volume connected in fluid communication with the mold cavity, said sleeve means having a supply opening for the supply of molding material to the hollow interior of said injection sleeve means for discharge under pressure into said cavity;

injection ram means including a piston movable axially within said hollow injection sleeve means;

drive means for moving said injection ram means within said injection sleeve means, said drive means determining the shot pressure of said molding material, the volumetric flowrate of which depends upon velocity of said injection ram means within said injection sleeve means;

means for sensing the pressure of the molding material when shot into the mold cavity and the shot pressure of said drive means, and generating a first output signal representative of the differential pressure across the piston of said injection ram means;



means for sensing the velocity of said injection ram means and for generating a second output signal representative thereof;

calculating means for receiving said first and second output signals, calculating the actual injection power of the machine as a function of the differential pressure and the volumetric flowrate of molding material into the mold cavity, and generating a third output signal representative of the actual injection power; and

means for displaying the third output signal for evaluation by operating personnel.

4,600,375

INJECTION APPARATUS INCLUDING MEANS FOR FEEDING SOLID RESIN TO AN INJECTION MEANS AND RADIANT HEATING MEANS TO MELT THE RESIN

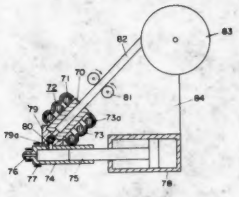
Norihisa Honsho, Yokohama, and Kazuhiro Mori, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 17, 1984, Ser. No. 601,160

Claims priority, application Japan, Apr. 18, 1983, 58-68697; May 25, 1983, 58-92806; Jun. 2, 1983, 58-96962; Jun. 9, 1983, 58-101754

Int. Cl.⁴ B29C *39/38, 45/13, 45/74*

U.S. Cl. 425—174.4 **5 Claims**



1. A resin injection machine comprising:

a transparent glass tube having one end open;

an infrared ray heater around the outside of said glass tube;

a material feed means for feeding a one-piece elongated body of meltable resin material in the direction of its length and axially of said glass tube into said open end of said tube;

an injection cylinder coupled to the other end of said glass tube; and

a changeover valve connected between the other end of said glass tube and said injection cylinder for controlling the movement of resin from the glass tube into the injection cylinder, whereby the infrared heater melts the resin material as it is fed into said glass tube and the further feeding of resin material is without stirring the molten resin, thereby avoiding entry of air into the molten resin.

4,600,376

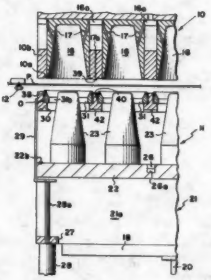
DIFFERENTIAL PRESSURE MOLDING APPARATUS EMPLOYING RELEASABLE RESTRICTED AREA MOLDING CLAMP RINGS

Tommie D. Gillman, Gladwin, and Dirk E. McKimmy, Beaverton, both of Mich., assignors to John Brown Inc., Beaverton, Mich.

Filed Jun. 14, 1985, Ser. No. 744,731

Int. Cl.⁴ A01J *21/00*

U.S. Cl. 425—346 **5 Claims**



1. Differential pressure molding apparatus for forming synthetic plastic parts in a plastic sheet, comprising:

a. opposed mold assemblies, one being a female mold assembly having a plurality of mold cavities and the other comprising a plug assist support from which a plurality of plug assists, aligned with said cavities, project;

b. means for supporting a deformable sheet of heated thermoplastic material in which parts are to be formed between said mold assemblies;

c. means for relatively moving said mold assemblies from separated to closed positions on opposite sides of the sheet to cause said plug assists to enter said cavities and move portions of the plastic sheet into said cavities, and from closed to separated positions to relatively withdraw said plug assists;

d. a clamp plate mounted for relative movement with the plug assist support having a plurality of openings of a size to pass said plug assists in alignment with said cavities, radially extending seats surrounding said clamp plate openings and axially extending walls extending axially away from said seats to the edges of said openings;

e. generally cylindrical, removable clamp rings seated in said openings in the clamp plate on said seats;

f. deformable resilient means mounted on one of said axially extending walls and clamp rings, and radially projecting shoulder means on the other, in radially overlapping engagement to restrain axial movement of said rings away from said seats and releasably maintain the rings in axial position in said clamp plate openings such that the clamp rings project slightly axially beyond the clamp plate;

g. means for urging said clamp plate and said clamp rings in a direction toward said female mold assembly and plastic sheet, such that, when the mold assemblies are relatively moved toward closed position, the clamp rings engage the female mold assembly to clamp the plastic sheet in position around the mold cavities first of all, before the plug assists move the plastic up into the mold cavities with continued relative closing movement of the mold assemblies; and

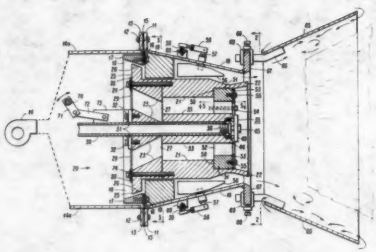
h. means for applying a differential pressure to opposite sides of the sheet to move the sheet finally into intimate engagement with the mold cavities when the mold assemblies have relatively moved to closed position.

4,600,377

REFRACTORILESS LIQUID FUEL BURNER

Joseph E. Musil, Ely, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Filed May 29, 1985, Ser. No. 738,941
Int. Cl.[4] F23D *15/00*
U.S. Cl. 431—351 12 Claims



1. A liquid fuel burner head comprising:

A. a generally annular burner head housing spacedly enveloping a generally cylindrical primary air assembly, the head and assembly each having corresponding forward and rearward ends,

(a) the primary air assembly having a plurality of internal primary air supply passage means extending in a generally forwardly direction in the assembly and emerging through annularly disposed primary air port means at the forward end of the primary air assembly,

(b) means effective to produce a swirl of primary air in one direction about the axis of the primary air assembly as said air emerges from the primary air port means,

(c) means associated with the primary air port means for adjusting the location of flame origin forward of and relative to the primary air port means,

(d) the primary air assembly including a liquid fuel supply passage and a nozzle, the nozzle being centrally disposed at the forward end of the primary air assembly and encompassed by the primary air port means, the liquid fuel nozzle being effective to discharge a substantially fan-like spray of liquid fuel just forward of and across the primary air port means,

(e) the primary air assembly and the nozzle together being axially moveable relative to the housing between forwardmost and rearwardmost positions respectively responsive to change in burner firing rate between a minimum and a maximum;

B. secondary air supply passage means disposed in the space between the housing and the primary air assembly,

(a) the secondary air supply passage means emerging through secondary air port means encompassing the forward end of the primary air assembly;

(b) secondary air directional means rearwardly of the secondary air port means effective to produce a swirl of secondary air either in said direction or in the opposite direction about said axis as said air emerges from the secondary air port means; and

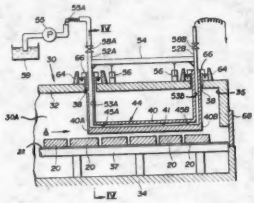
C. means rearwardly of the secondary air directional means and port means effective to meter the amount of secondary air supplied to the secondary air port means from a lesser quantity when the primary air assembly and nozzle are in their forwardmost position to a greater quantity when the primary air assembly and nozzle are in their rearwardmost position.

4,600,378

STEEL STRIP HEATING FURNACE AND METHOD

Sadao Fujita; Akira Toyokawa; Shinichiro Mutoh; Eishu Shimomukai, and Kenji Ueda, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed May 16, 1985, Ser. No. 734,975
Int. Cl.[4] F27B *9/28;* C21D *9/52;* F24J *3/00;* F27D *3/00*
U.S. Cl. 432—8 12 Claims



1. A heating furnace for flat steel products comprising:

a furnace body defining an enclosed heating space therein, said furnace body including a longitudinally extending heat-radiating side wall;

means for conveying the steel along a preset course through the furnace body with portions of said steel exposed to radiation from said side wall;

a movable wall extending along at least part of the length of said course and having a body portion movable toward and away from said portion of said side wall;

a cooling system incorporated into said movable wall for cooling said movable wall, said cooling system including means providing a cooling fluid path extending through said movable wall and means for connecting said cooling fluid path to a cooling fluid source, and said cooling system further including a flow control means which is connected to control the cooling fluid flow rate through said cooling fluid path; and

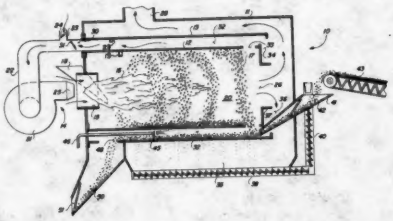
an actuator associated with said movable wall for moving the latter toward and away from said end portion of said steel.

4,600,379

DRUM HEATING AND MIXING APPARATUS AND METHOD

E. J. Elliott, 143 Variety Tree Cir., Altamonte Springs, Fla. 32714

Filed Sep. 9, 1985, Ser. No. 773,950
Int. Cl.[4] F27B *14/00, 7/02;* E01C *19/45;* B28C *5/46*
U.S. Cl. 432—13 16 Claims



12. A method of producing asphaltic pavement materials comprising the steps of:

feeding aggregate materials to an inner rotating drum;

directing a burner flame into said inner drum for heating said aggregate materials fed thereinto;

directing said aggregate materials from said inner drum to an outer concentric drum attached to said inner drum for feeding between said inner and outer drums;
feeding used asphaltic materials to said outer drum for mixing with said aggregate materials being fed from said inner drum;
spraying said mixture of aggregates and used asphaltic materials with an asphalt cement;
mixing said aggregates, used asphaltic materials and asphalt cement; and
discharging said mixture for use as a paving material.

4,600,380

GRATE PLATES RETAINING SOLIDS AND IMPROVING GAS DISTRIBUTION TO BE USED IN GRATES FOR THE HEAT TREATMENT OF SOLID MATERIAL

Karl von Wedel, Amselstrasse 5, 3057 Neustadt, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,030
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332592
Int. Cl.[4] F27B *15/00, 9/26;* **F26B** *17/00;* **C21B** *7/16*
U.S. Cl. 432—58 **20 Claims**

1. A grate element shaped as a grate plate and designed to form part of a working area of a grate structure for burning, cooling or otherwise heat-treating solid material by applying processing gas thereto while transporting said material in a predetermined transporting direction, said grate element having a substantially planar working surface for receiving and transporting said material, said working surface being provided with an array of recesses having a gas inlet and a gas outlet opening into said working surface for introducing said gas through said grate element into said material, wherein
(a) said grate element is shaped in the form of an elongated hollow substantially rectangular box having a width extending substantially transverse to said transporting direction and a length extending substantially in said transporting direction,
(b) said grate element comprises a pair of spaced lateral brackets forming side walls of said box and extending essentially in said transporting direction,
(c) said grate element further comprises a plurality of grate bars each extending perpendicularly between the upper ends of said lateral brackets, essentially transverse to said transporting direction, and having planar top surfaces forming the working surface of said grate element,
(d) said grate bars are spaced with respect to each other such that adjacent grate bars form a slot between each other, extending essentially transverse to said transporting direction, and forming said recesses for the introduction of said gas, and
(e) each of said grate bars has a cross-section perpendicular to said working surface to define a cross section of said slots which constitutes a high resistance to the passage of said gas and an impediment against said solid material intruding into said slots.

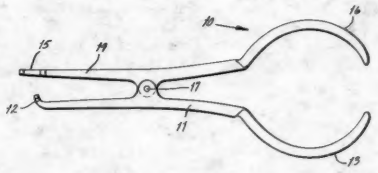
4,600,381

ORTHODONTIC BRACKET REMOVER

Edward W. Hodgson, 7322 Ravinia, St. Louis, Mo. 63121

Filed Apr. 25, 1985, Ser. No. 727,146
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—4 **7 Claims**

1. In the combination of an orthodontic bracket adhesively bonded to the surface of a tooth and a tool for removing said bracket wherein said bracket has a body section which has a base surface secured to the tooth surface and at least one wing element extending outwardly from the body over the tooth surface, said wing element having an undersurface in spaced relationship to the tooth surface, the improvement comprising a tool for removing the orthodontic bracket from the surface of the tooth which comprises
(a) first and second sections pivotally connected together to define first and second handles and first and second jaws for the tool,



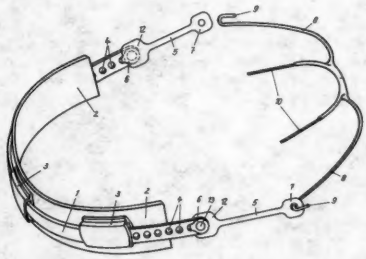
(b) a head formed on the free end of one of the jaws for engaging the outer surface of the tooth adjacent to the base of the bracket adhesively secured thereto, the head fitting alongside a side edge of the bracket base on the tooth to which the base is bonded, and
(c) a bracket engaging beak on the free end of the second jaw for engaging the undersurface of the bracket wing, wherein separation of the jaws will urge the bracket away from the tooth surface,
(d) the head and beak being laterally offset with respect to the centerlines of the jaws and handles.

4,600,382

ORTHODONTIC APPLIANCE

Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Forster GmbH, Pforzheim, Fed. Rep. of Germany

Filed May 2, 1985, Ser. No. 730,311
Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417256
Int. Cl.[4] A60C *7/00*
U.S. Cl. 433—5 **11 Claims**



1. In an orthodontic appliance comprising bow means adapted to be connected to at least one tooth to be corrected and having opposite outer end portions adapted to be disposed on respective sides of a head of a wearer,
retaining strap means having one pair of terminal portions adapted to be disposed on opposite sides of the head of the wearer at a distance from respective ones of said end portions, each of said terminal portions being formed with at least one series of holes spaced apart along said terminal portion, and
two resilient elements, each of which is detachably connected to one of said terminal portions at one of said holes

therein and to one of said end portions and is adapted to be stretched to pull said one end portion toward said one hole,

the improvement comprising each of said resilient elements comprises an elastically stretchable flat plastic strip, which is provided at one end with a first eyelet detachably connected to one of said end portions and is provided at its other end with a second eyelet detachably connected to one of said terminal portions at one of said holes therein,

each of said flat strips extending near the second eyelet thereof through one of said holes and having near the associated terminal portion a portion which is enlarged in width and adapted to contact the face of the wearer,

said enlarged portion having a convex surface facing the face of the wearer, so that the convex surface is in sliding contact with the face of the wearer, when said flat strips extend through said respective ones of said holes.

4,600,383

BONDING TO CALCIFIED TISSUES

Dennis C. Smith, Toronto, and Rolf Maijer, Duncan, both of Canada, assignors to Dennis Smith Consulting Limited, Toronto and Romada Holdings Ltd., Duncan, both of, Canada

Division of Ser. No. 545,881, Oct. 27, 1983, Pat. No. 4,548,583, and a continuation-in-part of Ser. No. 424,051, Sep. 27, 1982, abandoned, and a continuation of Ser. No. 235,166, Sep. 27, 1981, Pat. No. 4,382,792. This application Feb. 22, 1985, Ser. No. 704,340

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—9 **3 Claims**

1. An orthodontic method, which comprises:

forming an aqueous solution having a viscosity sufficiently high that the solution substantially does not flow when applied to a human tooth surface and containing ionic species capable of forming a calcium salt in crystalline form on and nucleated within the surface of the tooth,

applying said solution to an area of a tooth surface to which an orthodontic attachment is to be adhered for a sufficient time to interact with the tooth surface to grow crystals of a calcium salt adhered to and nucleated within the surface of the tooth,

washing spent solution from the surface of the tooth while retaining said crystals on said tooth surface,

applying an orthodontic cement to said crystals to cause the cement to flow into the crystal growth and to penetrate the treated tooth surface,

applying an orthodontic attachment to the orthodontic cement, and

curing the orthodontic cement, whereby said cured cement is adhered to the tooth by micromechanical interlock with the crystal growth by superficial penetration into the tooth surface.

4,600,384

SWIVEL COUPLING FOR ILLUMINATED DENTAL HANDPIECE

Robert A. Olsen, Palatine, Ill., assignor to Sybron Corporation, Rochester, N.Y.

Filed Sep. 28, 1984, Ser. No. 656,035

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—29 **1 Claim**

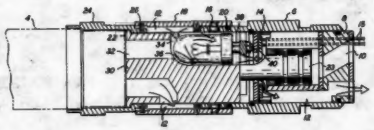
1. A swivel coupling device for connection between a dental handpiece and a supply hose, said coupling including:

a hose-connector portion defining passages for air and water and adapted for releasable connection to said hose in registry with corresponding air and water conduits therein,

a handpiece-connector portion defining passages for air and water and adapted for releasable connection to said handpiece in registry with corresponding air and water conduits therein, said handpiece-connector portion further defining a lamp cavity displaced from the axis of said coupling and in registry with an optical fiber bundle in said handpiece, said lamp cavity being a part of the flow path of exhaust air from said handpiece,

said hose-connector portion and said handpiece-connector portion being releasably and swivelably connected to each other,

an annular electrical commutator ring operatively and removably mounted to said hose-connector portion and facing the swivel interface of said coupling, and



a lamp removably mounted to a lamp base which is in turn removably mounted to said handpiece-connector portion so that said lamp is disposed within said cavity for illumination of said fiber bundle, said lamp base including spring loaded commutator brushes extending axially of said coupling for sliding contact with said commutator ring at the swivel interface of said coupling.

4,600,385

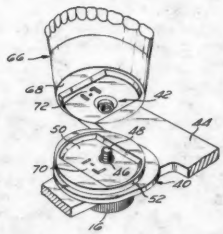
DENTAL CAST MOUNTING PLATE ASSEMBLY

Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324

Filed Feb. 8, 1985, Ser. No. 699,632

Int. Cl.[4] A61C *11/00*

U.S. Cl. 433—60 **8 Claims**



1. A dental cast mounting plate assembly for mounting a dental articulator frame, comprising:

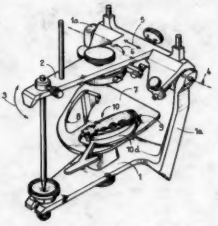
a plate having an opening therein and an area surrounding said opening for receiving a quantity of mounting plaster;

a projection formed separately from said plate, having a portion on one end to fit in said plate opening and having a head on the other end spaced from said plate area so that mounting plaster applied to said plate area can fit between the plate and said head so that the projection can be embedded in a dental cast while the plate remains separable from the cast, said projection one end being further formed to cooperate with a means for connecting the projection to said frame, said projection additionally includes a flange to engage said plate area surrounding the opening, and a reduced diameter neck between said flange and said head portion.

4,600,386
APPARATUS FOR THE PRODUCTION OF SMALL DENTAL PROSTHESES

Paul B. Feinmann, 18, chemin Barbey, 1292 - Chambesy - Canton of Geneva, Switzerland

Filed Jun. 13, 1985, Ser. No. 744,217
Claims priority, application Switzerland, Aug. 14, 1984, 3.896/84
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—60 3 Claims

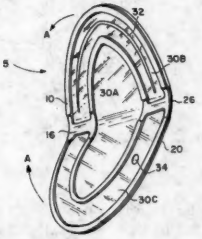


1. Apparatus for producing small dental prostheses with quadrant impression carriers comprising, an articulator, the articulator including a movable arm and an occlusion table, the table having at least one opening provided therein, a quadrant impression carrier removably position in said opening, said quadrant impression carrier having at least two outwardly extending arms formed thereon to bear on said table to maintain the quadrant impression carrier hooked in said opening.

4,600,387
RUBBER DAM FRAME FOR DENTAL WORK

Robert A. Ross, 2117 Jackson Heights Dr., Sebring, Fla. 33870

Filed Jun. 4, 1984, Ser. No. 616,568
Int. Cl.[4] A61C *5/14*
U.S. Cl. 433—136 14 Claims



1. A frame for a rubber dental dam sheet comprising:

a first frame member having a first essentially elliptical outer rim portion and a first essentially elliptical inner rim portion, said inner and outer rim portions joined along the minor axes thereof by a pair of first cross members, said first frame member including a projecting tongue essentially coincident with said first inner and outer rim portions;

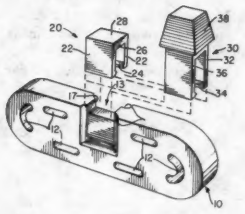
a second frame member having a second essentially elliptical outer rim portion and a second essentially elliptical inner rim portion, said second outer and inner rim portions essentially matching said first outer and inner rim portions, said second inner and outer rim portions joined along the minor axes thereof by a pair of second cross members, said second frame member including a groove complementary to said tongue and essentially coincident with said second inner and outer rim portions; and

said first frame member adapted thereby to have said tongue snapped into said groove of said second frame member for captivating a rubber dam sheet therebetween.

4,600,388
OSSEOUS INTEGRATED SUBMERGIBLE IMPLANT

Leonard I. Linkow, 1530 Palisade Ave., Fort Lee, N.J. 07024

Filed Feb. 23, 1984, Ser. No. 582,935
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—176 16 Claims



1. An oral implant for supporting an artificial tooth structure, comprising:

an implant portion having opposite side walls and being adapted to be fitted in an opening in a bone in the vicinity of the occlusal plane, which bone has been exposed by an incision in the covering fibromucosal tissue, said implant portion being adapted to be submerged below the upper edge of the opening in the bone; and

at least one post assembly having a neck portion and a post portion, the neck portion of said post assembly being detachably connected to said implant portion and being adapted to straddle said implant and to make friction contact with its opposite side walls when connected thereto, the post portion being adapted to receive the artificial tooth structure.

4,600,389
DENTAL RESTORATION METHOD AND COMPOSITION THEREFOR

Abraham Schwartz, Durham, N.C., assignor to Magnetic Activated Particle Sorting, Inc., Carrboro, N.C.

Filed Oct. 29, 1984, Ser. No. 665,709
Int. Cl.[4] A61K *6/08*
U.S. Cl. 433—217.1 13 Claims

1. A method for dental restorations in which a dental compound adapted to set and harden after application is applied to a selected site, comprising the steps of:

(a) making up the dental compound to be applied to the operation by incorporating microbeads containing a fluorescent rare earth chelated compound in said dental compound, said microbeads functioning to permanently isolate said fluorescent compound within said microbeads. incorporated with said dental compound wherein said dental compound is not fluorescent in the wavelengths in which said fluorescent compound fluoresces;

(b) applying the dental compound to the site of the desired operation and allowing such compound to set and harden at the site; and

(c) observing the site under radiation at a wavelength selected to cause said fluorescent compound to fluoresce while isolated in said microbeads as a step preparatory to said restoration.

10. A dental composition useful under ultraviolet light exposure for exhibiting its boundaries and margins after being applied in restorations comprising:

(a) polymeric hydrophobic microbeads containing a rare earth chelated compound characterized by being hydrophobic and fluorescent in the visible range under ultravio-

let illumination, said microbeads functioning to permanently isolate said fluorescent compound therein; and

(b) a hardenable dental restorative material.

4,600,390

APPARATUS AND METHOD FOR APPLYING A SILICON OXIDE-CONTAINING ADHESION-PROMOTING LAYER ON METALLIC DENTAL PROSTHESES

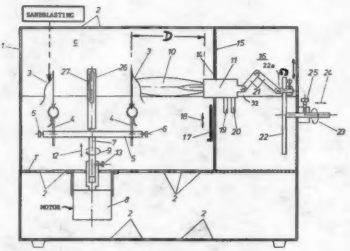
Roland Göbel; Rudolf Musil; Hans-Jürgen Tiller, all of Jena; Steffen Oppawsky, Bad Homburg; Albert Schmidt, Bad Homburg, and Rolf Janda, Bad Homburg, all of Fed. Rep. of Germany, assignors to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Dec. 26, 1984, Ser. No. 686,211

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403894

Int. Cl.[4] **A01N** *1/02;* **A61C** *5/08;* **B05B** *7/06;* **B05C** *5/00*

U.S. Cl. 433—218 **20 Claims**



17. A process for applying a carbon-containing and silicon oxide-containing adhesion-promoting layer to a metallic dental prosthesis part (**3**), in an apparatus having

a holder (**4**) supporting said prosthesis part (**3**);

at least one flame hydrolysis burner (**11**); and

means (**5, 8, 9**) for relatively moving the dental prosthesis part (**3**) and said flame hydrolysis burner (**11**); comprising the steps of

(a) supplying ignition energy and controlled amounts of carbon-containing fuel gas and air to said hydrolysis burner;

(b) controlling said burner (**11**) to provide a flame cone which has a length (L) of at least about 15 cm and up to about 20 cm, and having a gas stream speed of up to about 1 m/sec;

(c) supplying a metered amount of a silicon compound in vapor or gas form to said burner (**11**);

(d) relatively moving said flame hydrolysis burner (**11**) and the metallic dental prosthesis part (**3**) at least once to with a distance (D) of each other of, at the most, about 15 cm, so that said part (**3**) passes within said flame cone, thereby depositing on said metallic part (**3**) a layer of silicon oxide which includes 5% to 40%, by weight, of carbon; and

(e) removing said prosthesis part (**3**) from said flame cone until said deposited layer cools and solidifies.

20. The coated metallic dental prosthesis product (**3**) made by the process of claim **17**.

4,600,391

ION-IMPLANTED ENDODONTIC POST

Ezekiel J. Jacob, 25 Monroe Pl., Brooklyn, N.Y. 11201

Filed Aug. 22, 1984, Ser. No. 643,231

Int. Cl.[4] **A61C** *5/08*

U.S. Cl. 433—220 **6 Claims**

1. An endodontic post for attaching to a natural tooth part for anchoring an artificial coronal portion to said tooth part, said post comprising an apical section for inserting in said natural tooth part, said apical section being of such a size that it is contained entirely within the tooth part when in use, and further comprising an upper section for extending above the natural tooth part, said upper section having anchoring means

for attaching said artificial coronal tooth portion, said post being made from metal and wherein the surface of at least said apical section is ion implanted at the top grain level with ions of a substance that is dissimilar to the metal of said post.

4,600,392

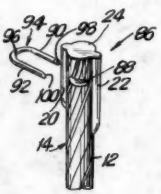
CONTOURED DENTAL POST

Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.

Filed May 20, 1985, Ser. No. 735,548

Int. Cl.[4] **A61C** *5/04*

U.S. Cl. 433—225 **15 Claims**



1. A dental post for retaining a dental restoration onto a prepared tooth stub having a canal with a bore drilling into the canal walls which have an approximate oval shape adjacent to an outer surface of the tooth stub, said dental post comprising:

an elongated cylindrical body portion having a substantially uniform circular cross section from a top end to a bottom end of said body portion;

rib means provided on an upper portion of said body portion for extending into the canal and fitting the approximate oval shape of the canal in the tooth stub, said rib means including a pair of diametrically opposed radially projecting ribs extending from said top end longitudinally along said upper portion of said body portion and being spaced from said bottom end;

one of said ribs being longer than the other rib to provide pilot means for inserting said ribs into the bore; and

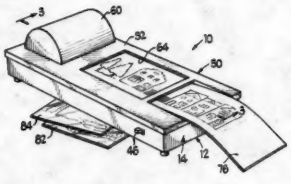
said body portion including peripheral securing means for anchoring said body portion with cement within the bore in the tooth stub so that a part of said upper portion of said body portion extends above the tooth stub.

4,600,393

PORTABLE SELF-CONTAINED LIGHT BOX DRAWING TOY

Donald A. Rosenwinkel, Oak Park, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 11, 1985, Ser. No. 690,582
Int. Cl.[4] G09B *11/06*
U.S. Cl. 434—88 **7 Claims**



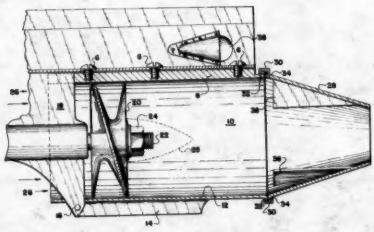
1. A toy drawing machine comprising:
a hollow, closed housing with elongated sides between one end and the other end;
the closed housing including a lower portion and a hinged cover that pivots open for access to the hollow interior;
a roll of paper mounted within the closed housing adjacent the one end for rotational dispensing;
a light source within the housing
a light transmitting platen carried by the housing above the light source;
means permitting extension of a portion of the paper from the roll over the platen and out the other end of the closed housing without having to pivot open the cover;
the cover including means permitting drawing access to the extended portion of the paper over the platen;
a transparency bearing a graphic design; and
the housing further including means for inserting the transparency in a direction transverse to an elongated side and positioning the transparency between the platen and the extended portion of the paper.

4,600,394

MARINE PROPULSION UNIT

Theodore D. Dritz, 1240 El Sur Way, Sacramento, Calif. 95825

Continuation of Ser. No. 376,683, May 10, 1983, abandoned.
This application Aug. 6, 1984, Ser. No. 638,633
Int. Cl.[4] B63H *11/00*
U.S. Cl. 440—38 **15 Claims**



1. Thrust intensifying marine propulsion unit for a marine vessel having a generally horizontally extending outer hull, which comprises
a fluid flow cylindrical housing of generally parallel side internal flow configuration and having a generally straight horizontal axis and an ingress end and an egress end in axial alignment therewith, said housing being arranged completely externally of the generally horizontally extending outer hull of the marine vessel and generally horizontally in generally parallel spaced relation to such hull for direct open axial flow of fluid through said housing from the ingress end to the egress end thereof and correspondingly in generally parallel spaced flow relation to such generally horizontally extending outer hull,
an axial thrust fluid impeller disposed for rotation in said housing and having blades which are arranged in completely overlapping relation with each other and which are disposed for rotation in said housing remote from the egress end thereof, said impeller being arranged on a rotatable shaft means in axial alignment with said housing and with the ingress and egress ends thereof for defining a substantially axially constant internal flow cross-sectional path within the generally parallel side internal flow configuration confines of said housing in any position of rotational movement of said impeller in said housing,
direct open axial flow receiving fluid ingress means arranged completely externally of the generally horizontally extending outer hull of the marine vessel and correspondingly in generally parallel spaced relation to such hull and axially at the ingress end of said housing and adjacent to said impeller, said ingress means being substantially in axial alignment with said housing and impeller, and being substantially completely open to direct axial flow of fluid into said ingress means and therethrough correspondingly in generally parallel spaced flow relation to such generally horizontally extending outer hull and leading directly to said impeller in said housing, and
fluid egress means arranged completely externally of the generally horizontally extending outer hull of the marine vessel and correspondingly in generally parallel spaced relation to such hull and axially at the egress end of said housing and remote from said impeller blades, said egress means being substantially in axial alignment with said ingress means, housing and impeller, and having a leading end adjacent to said housing and a trailing end remote from said housing and converging from the leading end to the trailing end for providing a reduced internal flow cross-sectional area at the trailing end for propulsion exhausting from the unit of fluid impelled by said impeller,
said housing having an internal flow cross-sectional area generally corresponding to the area of said impeller such that the overlapping blades of said impeller substantially fill the cross-sectional area of said housing thereat, and said ingress means having an internal flow cross-sectional area and shape generally corresponding to that of said housing.

4,600,395

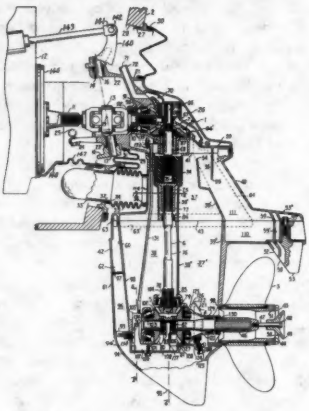
BOAT DRIVE

Heinz Pichl, Upsala, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed May 31, 1979, Ser. No. 44,053
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **48 Claims**

14. In an inboard-outboard drive unit for a boat comprising an inboard engine, an outboard leg and a gimbal member carrying said leg on a generally upright axis and having hori-

zontally disposed oppositely arranged coaxial journal elements, first bearing means on said journal elements mounted to



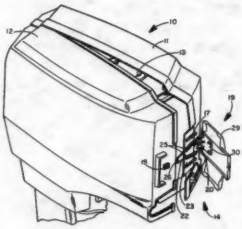
the boat for supporting said gimbal and second bearing means on said journal elements supportingly attached to said engine.

4,600,396

COWL LATCH FOR OUTBOARD MOTORS

Paul W. Crane, and David W. Kusche, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Dec. 19, 1983, Ser. No. 562,954
Int. Cl.[4] B63H *21/24*
U.S. Cl. 440—77 5 Claims



3. A cowl assembly for enclosing the engine of an outboard motor comprising:

(A) a port cowl member;

(B) a starboard cowl member;

(C) a hinge means at the aft end of said cowl members to support said cowl members on a generally vertical pivot axis;

(D) a latch assembly at the forward end of said cowl members for latching said cowl members together to enclose said engine, said latch assembly including

(1) a catch mounted on one of said cowl members,

(2) a lever pivotally attached to the other of said cowl members, and

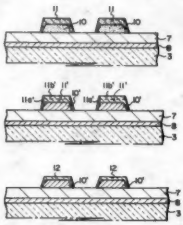
(3) a resilient member pivotally attached to said lever, said resilient member including two springs connected by an integral intermediate portion, said integral intermediate portion forming a hook for engaging said catch.

4,600,397

METHOD OF PRODUCING DISCHARGE DISPLAY DEVICE

Osamu Kawakubo, Saitama; Eiji Munemoto, and Akihiko Okubora, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1985, Ser. No. 721,956
Claims priority, application Japan, Apr. 19, 1984, 59-79218
Int. Cl.[4] H01J *9/12*
U.S. Cl. 445—6 3 Claims



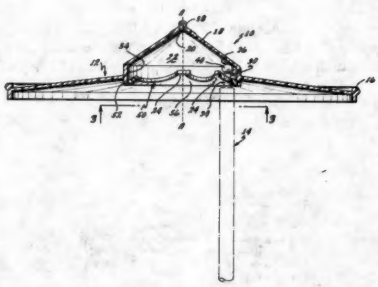
1. A method of producing a discharge display device comprising the steps of applying to a dielectric substrate a conductive paste containing a glass binder, temporarily drying said conductive paste layer, forming a LaB_6 layer containing no glass binder on said conductive paste layer, burning said conductive paste layer and said LaB_6 layer at the same time, and activating said LaB_6 layer after being burnt by gas discharge with large current after an exhaustion step to form a LaB_6 cathode.

4,600,398

SPINNING TOY

Cornelio Fraga, 6329 Casitas Ave., Bell, Calif. 90201

Filed Oct. 1, 1984, Ser. No. 655,770
Int. Cl.[4] A63H *1/02*
U.S. Cl. 446—240 19 Claims



1. A toy comprising:

a free flying rotor body having an axis of rotation and provided with a plurality of tooth elements extending into a central aperture and disposed in a circular arrangement concentric with said axis of rotation, each said tooth element having a leading edge and a trailing edge; and

a wand rod including a handle end and a wand tip;

said trailing tooth edges being engageably by said tip for transmitting movement of the wand tip through a circular trajectory to the rotor body thereby to impart a spin to said rotor body, said tip being disengageable from said tooth element by movement of said tip towards said axis of rotation, said wand tip being shaped for interlocking with

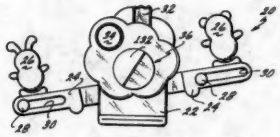
said teeth against withdrawal in a direction transverse to the plane of said circular tooth arrangement during such engagement.

4,600,399

SEQUENTIAL ACTION TOY HAVING A PLURALITY OF CAMS

Akira Abe, Tokyo, Japan, assignor to Tomy Kokyo, Co. Inc., Tokyo, Japan

Filed Oct. 31, 1983, Ser. No. 546,958
Claims priority, application Japan, Nov. 4, 1982, 57-167090[U]
Int. Cl.[4] A63H *1/24*
U.S. Cl. 446—242 20 Claims



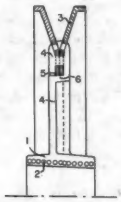
1. A sequential action toy which comprises:
a housing;
motor means located on said housing;
a first cam means rotatably mounted on said housing in operative association with said motor means and rotated about an axis by said motor means;
said first cam means having a surface which is oriented perpendicular to said axis;
said first cam means including first and second cams located thereon and extending axially in the same direction away from said surface, the shape of said first cam different from the shape of said second cam and the axial displacement of said second cam from said surface is greater than the axial displacement of said first cam from said surface;
a first movable member movably mounted on said housing in association with said first cam means, said first movable member including a first cam follower located thereon, said first cam follower positioned in association with said first cam means axially displaced from said surface in a location whereby said first cam follower is independently engagable by both said first and said second cams in response to rotation of said first cam means so as to move said first member on said housing;
a second movable member movably mounted on said housing in association with said first cam means, said second movable member including a second cam follower located thereon, said second cam follower positioned in association with said first cam means axially displaced from said surface in a location whereby said second cam follower is engaged by said second cam in response to rotation of said first cam means so as to move said second member on said housing;
at least a portion of each of said first and said second cams are radially displaced the same distance from said axis;
said first and said second cam followers also being radially displaced the same distance from the axis with the radial displacement of said first and said second cam followers being essentially the same as the radial displacement of said portion of each of said first and said second cams;
said first movable member is slidably mounted on said housing and is positioned tangential to the locus of the pathway of movement of said portions of said first and said second cams.

4,600,400

WHEEL-SHAPED OBJECTS

Stig Hallerbäck, Västra Frölunda, Sweden, assignor to Aktiebolaget SKF, Goteborg, Sweden

Filed Jul. 3, 1985, Ser. No. 751,441
Claims priority, application Sweden, Sep. 5, 1984, 8404438
Int. Cl.[4] F16H *55/36*
U.S. Cl. 474—166 3 Claims



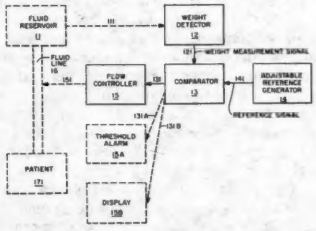
1. A wheel-shaped object such as a pulleys, incorporating a rigid, interior hub (1) a rigid outer circumferential portion (3) and therebetween an interconnecting web portion (4) made from a material having a higher coefficient of thermal expansion than said hub (1) and said circumferential portion (3), characterized therein, that the web portion (4) in circular cross-section has a zigzag-like design and that the web portion (4) material is provided with through-grooves (5) arranged alternatingly on both sides of the circumferential portion (3), wherein the material of the web portion (4) encloses the circumferential portion (3) thus that the material of the web portion (4) during cooling can disengage itself from the circumferential part (3) at these grooves (5), whereby the development of undesired tensile stresses is prevented.

4,600,401

FLUID FLOW CONTROL SYSTEM

Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Deerfield, Ill.

Division of Ser. No. 254,304, Apr. 18, 1981, Pat. No. 4,411,649, which is a continuation-in-part of Ser. No. 56,871, Jul. 12, 1979, abandoned. This application Oct. 18, 1983, Ser. No. 542,982
The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—65 7 Claims



1. A system for controlling in a desired manner the flow of fluid in a line from a reservoir to a patient, such system comprising:
first means, for generating a first digital electrical signal indicative of the weight of the fluid in the reservoir, such first signal hereinafter called the "weight mesurement signal";
second means, for generating a second digital electrical signal indicative of the desired rate of decrease in weight

of the fluid in the reservoir, and thereby indicative of the desired rate of flow of fluid from the reservoir, such second signal hereinafter called the "weight reference signal"; and

digital comparator means, having two inputs, on one of which is impressed the weight measurement signal and on another of which is impressed the weight reference signal, for producing an output indicative of the dissimilarity between the weight measurement and weight reference signals;

third means, for controlling flow of the fluid from the reservoir at a rate dependent upon an electrical input thereto, such input being connected so as to receive a signal related to that present at the output of the digital comparator means, such third means being incrementally adjustable between closed and open conditions; and

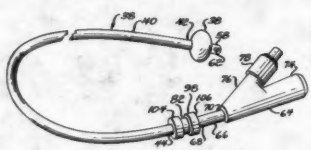
fluid delivery means, for delivering fluid from the reservoir to the patient, such means subject to control of the third means, so that flow of fluid to the patient is controlled at the desired rate established by the second means.

4,600,402

CATHETER WITH LOCKING DEVICE

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Dec. 18, 1984, Ser. No. 683,053
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—96 **3 Claims**



1. A catheter, comprising:

a first distal shaft section having a first distal drainage lumen extending therethrough, and a first inflation lumen extending through a wall of the first shaft section;

an elastic sleeve bonded to a distal portion of the first shaft section in circumferential zones defining a cavity beneath the sleeve communicating with the first inflation lumen;

a proximal portion comprising a second proximal shaft section having a second drainage lumen extending therethrough, a hollow connector defining a continuation of the second drainage lumen, a side arm having a valve, and a second inflation lumen extending through the side arm from the valve and through the second shaft section to a distal end of the proximal portion; and

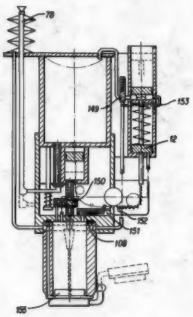
means for releasably locking the first shaft section to the proximal portion while establishing communication between the first and second drainage lumens and between the first and second inflation lumens, wherein the locking means comprises, a body member having a first tubular section extending through the body member and having opposed ends projecting from the body member, said opposed ends of the first tubular section being receivable in the first and second inflation lumens, a second tubular section extending through the body member and having opposed ends projecting from the body member, said opposed ends of the second tubular section being receivable in the first and second drainage lumens, and means for gripping an outer surface of the first and second shaft sections.

4,600,403

SUCTION INJECTOR II

Wolfgang Wagner, Exerzier Str. 1, 1000 Berlin, Fed. Rep. of Germany, assignor to Wolfgang Wagner, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 241,378, Feb. 26, 1981, Pat. No. 4,393,870, which is a continuation-in-part of Ser. No. 93,615, Nov. 9, 1979, Pat. No. 4,284,077, which is a division of Ser. No. 933,136, Aug. 14, 1978, abandoned, and a continuation-in-part of Ser. No. 793,951, May 5, 1977, Pat. No. 4,114,691, which is a continuation-in-part of Ser. No. 634,741, Nov. 21, 1975, abandoned. This application Aug. 6, 1982, Ser. No. 405,559
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—115 **26 Claims**



1. A suction injector, particularly for use with hypodermic injections, comprising a liquid container with a pressurized gas compartment sealed from said liquid; a hose connected to said liquid liquid container for the transmission of said liquid through a connection fitting with a cannula attachment pipe to a cannula; compressing means moved by a motor which is in connection with a power source, to regulate the stream of said liquid through said hose by means of a mechanism for multiple predetermined dosing; a suction source connected to a suction cup; triggering means corresponding to firm skin contact of the suction cup for operating said dosing compressing means; and means for blocking and marking said blocking of the function of said injector, if the liquid supply into said container with hose is nearly exhausted.

4,600,404

HEAT SEALABLE WATER DISPERSIBLE ADHESIVE

Donald A. Sheldon, Outagamie County, Wis.; Bruce G. Stokes, Cherokee County, Ga.; Robert E. Weber, Cobb County, Ga., and Edwin G. Greenman, Cherokee County, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 618,810, Jun. 6, 1984, Pat. No. 4,522,967. This application Nov. 16, 1984, Ser. No. 657,930
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—387 **3 Claims**

1. A flushable cellulosic convolutely wound tampon tube having a water-dispersible heat-activatable adhesive comprising:

25–87.5 parts by weight polyethyloxazoline

75–12.5 parts by weight polyethyloxazoline compatible water-dispersible plasticizer with a Tg below about 10° C. and an antiblocking agent at a level of 5 to 35 parts per 100 parts of polyethyloxazoline plasticizer mixture, said antiblocking agent selected from the class consisting of moderate molecular weight polyethylene glycol and polypropylene glycol.

4,600,405

MECHANICAL HEART

Henry S. Zibelin, 1423 26th St., NW., Winter Haven, Fla. 33881

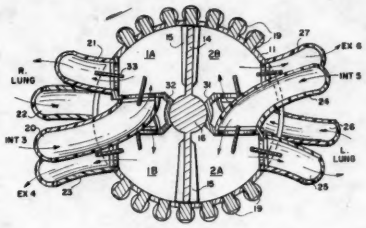
Filed Oct. 7, 1985, Ser. No. 784,730
Int. Cl.[4] A61F 2/22
U.S. Cl. 623—3 16 Claims

1. An artificial heart for pumping blood through a circulatory system comprising in combination:

a housing having a plurality of expandable and contracting chambers formed therein, wherein for each of said plurality of chambers an oscillating impeller forms at least one wall of said chamber;

said oscillating impeller located in said housing and rotably attached thereto for expanding and contracting said housing chambers responsive to an oscillatory movement thereof for which each oscillation consists of a total angular displacement of said impeller of less than 360 degrees;

electromagnetic impeller drive means located outside said housing chamber for rotating said impeller first in one direction and then in said second direction to expand and then to contract a plurality of chambers in said housing, said impeller drive means generating an electromagnetic field through said housing; and



electomagnetic control means for controlling said electronic impeller drive means to move said impeller at a predetermined rate.

4,600,406

METHOD OF LOW TEMPERATURE BLEACHING WITH REDUCED AMOUNTS OF CHLORINE REQUIRING REDUCED BLEACHING INTERVALS

George E. Corte, Wyandotte, Mich., assignor to Diversey Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 22, 1985, Ser. No. 715,183
Int. Cl.[4] D06L *3/06*
U.S. Cl. 8—108 R 24 Claims

1. A method for reducing the time period required for bleaching textile materials in water without sacrificing cleaning efficiency comprising the steps of:

adding a source of bromide ions to a wash water containing textile materials to be bleached in an amount sufficient to impart an initial bromide ion concentration between about one and about twenty-five parts per million;

adding a source of chlorine-containing ions in an amount sufficient to yield an initial chloride ion concentration in an amount between about fifty and about ninety parts per million;

agitating the wash water to provide intimate contact between the textile materials and bleaching agents while the bleaching agents are added;

maintaining the textile materials in the wash water with agitation for a period between about 30 seconds and five minutes; and

recovering the textile materials from the wash water in an effectively bleached condition.

4,600,407

PROCESS FOR THE PRODUCTION OF SWELLABLE FILAMENTS, FIBERS AND SHAPED STRUCTURES OF ACRYLIC POLYMERS, AND THE PRODUCTS OBTAINED THEREBY

Bernd Huber, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 750,046
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034660
Int. Cl.[4] D01F *6/18;* D02G *3/02;* D04B *1/14*
U.S. Cl. 8—115.54 8 Claims

1. A method for making a fiber or filament of a swellable polymer of high tensile strength, which method consists essentially of reacting a fiber or filament of an untreated copolymer of acrylonitrile containing about 10 to 30 percent by weight of carboxyl groups with a base in the absence of water to convert said carboxyl groups at least partially into a corresponding salt form.

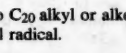
4,600,408

GASOLINE COMPOSITIONS CONTAINING CARBONATES

Peter J. Jessup, Santa Ana; Stephen G. Brass, Fullerton, and Michael C. Croudace, Huntington Beach, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 29, 1985, Ser. No. 728,244
Int. Cl.[4] C10L *1/18*
U.S. Cl. 44—70 11 Claims

1. A composition comprising a major amount of a liquid hydrocarbon base fuel and an anti-knock enhancing amount of a compound of a formula:



wherein R is a C_1 to C_{20} alkyl or alkenyl radical and R′ is an unsubstituted phenyl radical.

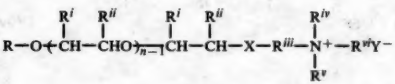
4,600,409

QUATERNARY DEPOSIT CONTROL ADDITIVES

Curtis B. Campbell, Rodeo, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 632,784, Jul. 20, 1984, Pat. No. 4,564,372, which is a continuation-in-part of Ser. No. 518,506, Jul. 29, 1983, abandoned, and a continuation-in-part of Ser. No. 518,505, Jul. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 510,128, Jun. 30, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 791,180
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[4] C10L *1/22*
U.S. Cl. 44—71 15 Claims

1. A compound suitable for use as a fuel additive having the formula



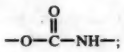
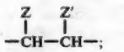
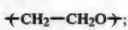
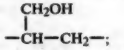
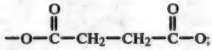
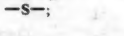
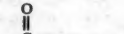
wherein

R=an alkyl group of 5 to 30 carbon atoms, aryl group of 6 to 30 carbon atoms, aralkyl group of 7 to 30 carbon atoms, aralkyl group of 7 to 30 carbon atoms, or methylol-substituted alkyl group of 5 to 30 carbon atoms;

R^i and R^{ii} independently=hydrogen, methyl or ethyl;

n=1 to 30;

X=a connecting group selected from the group consisting of:

carbamates	
ethylene	
oxyethylene	
methylol ethylene	
succinates	
ethers	
thioethers	
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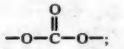
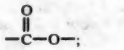
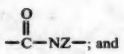
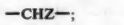
carbonates	
esters	
amides	
methylene	

where

Z and Z′=H, or an alkyl group of from 1 to 2 carbon atoms;

R^{iii}=chemical bond, an alkylene or hydroxy-substituted alkylene group of 2 to 12 carbon atoms, or —NH—CH_2—CH_2—$_x$, where x=1 to 5;

R^{iv} and R^v independently=alkyl groups of 1 to 20 carbon

atoms, aralkyl group of 7 to 20 carbon atoms, aralkyl group of 7 to 20 carbon atoms, or phenyl;

R^W=alkyl groups of 1 to 20 carbon atoms, aralkyl groups of 7 to 20 carbon atoms, aralkyl groups of 7 to 20 carbon atoms, phenyl, or $—NH—CH_2—CH_2—_x$, where x=1 to 5;

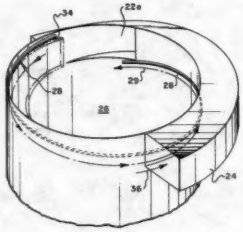
Y=a halide selected from the group consisting of chloride, bromide or iodide.

4,600,410

PROCESS AND APPARATUS FOR SEPARATING PARTICULATE MATTER FROM A GASEOUS MEDIUM

Lloyd A. Baillie, Homewood, Ill., and Amy L. Ryder, Munster, Ind., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1984, Ser. No. 683,523
Int. Cl.[4] B04C *5/103*
U.S. Cl. 55—1 **5 Claims**



1. A process for separating particulate matter from a contaminated gaseous medium containing the particulate matter comprising:

(a) passing said contaminated gaseous medium through means forming a gas inlet to a swirl-inducing zone and through said swirl-inducing zone to form a flow of swirling-contaminated gaseous medium;

(b) introducing said swirling-contaminated gaseous medium into a cyclonic separation zone via an introduction zone adjacent to the inner surface of a wall defining the periphery of said separation zone to separate at least a portion of said particulate matter from said swirling-contaminated gaseous medium to form a laminar flow region extending radially inward from said wall including a layer of said particulate matter on said inner surface of said wall, and to form a gaseous product which is at least partially depleted of said particulate matter;

(c) deflecting substantially only said flow of gaseous medium in said laminar flow region and including said layer of particulate matter below said gas inlet and said introduction zone;

(d) removing said gaseous product from said separation zone through an exhaust flow zone disposed radially inward from said swirl-inducing zone; and

(e) removing said particulate matter through a particulate removal zone below said separation zone.

4,600,411

PULSED POWER SUPPLY FOR AN ELECTROSTATIC PRECIPITATOR

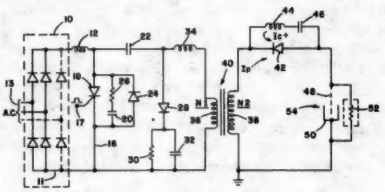
George T. Santamaria, Solana Beach, Calif., assignor to Lucidyne, Inc., San Diego, Calif.

Filed Apr. 6, 1984, Ser. No. 597,506
Int. Cl.[4] B03C *3/68*
U.S. Cl. 55—139 **30 Claims**

1. An electrostatic precipitator power supply circuit for generating voltage pulses on the precipitator while allowing a residual collection voltage to be retained on the precipitator during intervals between pulses, where the voltage of the pulses is substantially in excess of the residual voltage, said power supply circiut comprising:

means for generating said high voltage pulses at the secondary inductance of a step-up transformer by discharging a capacitor through the primary inductance of a the step-up transformer;

said electrostatic precipitator connected to the secondary inductance of said step-up transformer to receive said high voltage pulses; and



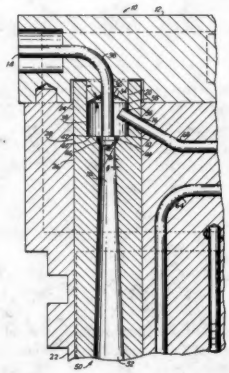
means for returning a portion of said high voltage pulses to said capacitor, and for maintaining said residual voltage on the precipitator during interpulse periods including means with a variable impedance adapted for providing a maximum impedance during interpulse periods and a minimum impedance during high voltage pulses and means for causing said variable impedance means to exhibit a minimum impedance during said return of a portion of said high voltage pulses.

4,600,412

WATER SEPARATOR

Max D. Liston, Irvine; James R. Braig, El Toro; Wayne Blackburn, Irvine, and Paul Hsei, Huntington Beach, all of Calif., assignors to Datascope Corporation, Oakland, N.J.

Filed Oct. 9, 1984, Ser. No. 659,097
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—189 **12 Claims**



1. A water separator adapted for use with a gas analyzer, which comprises:

a housing being formed with a gas inlet port and a gas outlet port, the housing having a first chamber formed therein, the housing including an upper interior surface defining the upper extent of the first chamber, and a lower interior surface defining the lower extent of the first chamber, the lower interior surface having a central opening formed therein, the upper interior surface having a peaked shaped;

a gas inlet conduit communicating with the gas inlet port and extending at least from the upper interior surface partially

into the first chamber, the gas inlet conduit having an end positioned above and aligned with the central opening formed in the lower interior surface;

a gas outlet conduit communicating with the gas outlet port and extending partially into the first chamber; and

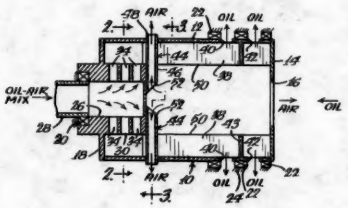
a fluid reservoir communicating with the central opening formed in the lower interior surface for collecting water.

4,600,413

CENTRIFUGAL DEAERATOR AND PUMP

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 10, 1984, Ser. No. 680,146
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—207 **14 Claims**



1. A rotary degassifier comprising a generally cylindrical housing;

means mounting said housing for rotation about its cylindrical axis;

a first gas outlet from said housing generally on said axis;

means and adjacent one end of said housing for introducing a liquid containing entrained gas;

means adjacent the other end of said housing and radially outwardly of said axis defining a liquid outlet for degassified liquid; and

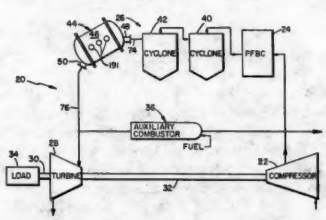
means in said housing spaced from said introducing means defining a generally radially elongated gas passage terminating in a second gas outlet from said housing and gas inlet within said housing, said gas inlet being disposed radially inwardly of said liquid outlet.

4,600,414

APPARATUS FOR REMOVING CONTAMINANTS FROM HEATED GASES

Arthur G. Metcalfe, National City; James C. Napier, and William A. Compton, both of San Diego, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Division of Ser. No. 434,103, Oct. 13, 1982, Pat. No. 4,568,365.
This application Dec. 20, 1984, Ser. No. 684,051
Int. Cl.[4] B01D *45/08*
U.S. Cl. 55—290 **21 Claims**



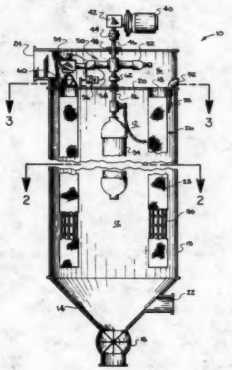
1. Hot gas clean-up apparatus of the impact separation type comprising: a vessel; means for introducing gases to be cleaned into said vessel; means for trapping contaminants separated from said gases, said contaminants trapping means being housed in a collection zone in said vessel and being impactable by said contaminants as they are separated from said hot gases; means for so effecting a change in the direction of flow of the gases introduced into said vessel that contaminants mixed therewith will be their inertia impact against and adhere to the impactable means provided to trap said contaminants; and means via which gases from which contaminants have been thus separated can exit from said vessel, the means for introducing gases being cleaned into said vessel being so structured as to cause said gases to move through said collection zone from one side of said zone to the other and the means for effecting the change in the direction of flow of said gases being structured to accommodate that movement of the gases through the removal zone while effecting that change in the direction of flow of the gases which results in the impingement of the contaminanats on the means which is impactable by the contaminants.

4,600,415

GAS FILTERING APPARATUS

William J. Barton, Wichita, Kans., assignor to Kice Metal Products, Inc., Wichita, Kans.

Filed Feb. 25, 1985, Ser. No. 704,957
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—294 **10 Claims**



1. A gas filtering apparatus for separating particulate matter from air comprising:

a cylindrical housing having dirty air and clean air plenum chambers;

a substantially horizontal circular partition in the housing separating the dirty and clean air chambers having a plurality of circular bag openings therein;

a plurality of radially spaced longitudinally extending filter bags attached to the partition openings; each having a substantially unrestricted mouth therein;

an inlet port connected to the dirty air chamber for receiving the particulate laden air;

a discharge port in the clean air chamber for discharging the clean air;

a rotating cleaning arm, pivotally mounted within the clear air chamber to rotate over the bag openings in the partition;

a source of high pressure air connected to said arm;

a nozzle means attached to the high pressure source and positioned on the arm to direct a reverse flow high velocity jet of air into said partition openings;

pilot operated valve means on the arm for momentarily opening the flow of high pressure air through the nozzle means into each of the partition openings; a converging

venturi means attached to the arm in axial spaced apart alignment with the nozzle means;

a closure plate means attached to the arm which substantially covers a partition opening when axially aligned therewith whereby the high velocity jet and the entrained air are momentarily retained within the bag;

means for rotating the cleaning arm; and

cam means for actuating the valve means as the cleaning arm passes over each of the partition openings.

4,600,416

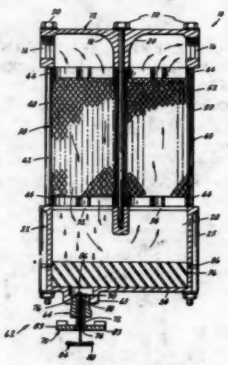
AIR LINE VAPOR TRAP

David O. Mann, Hamilton, Ind., assignor to La-Man Corporation, Hamilton, Ind.

Filed Feb. 8, 1985, Ser. No. 699,729

Int. Cl.[4] B01D *36/02*

U.S. Cl. 55—323 **7 Claims**



1. An in-line trap for removing vapor from a compressed air line or the like comprising

a manifold including means defining an inlet and an outlet, and means between said inlet and outlet for directing incoming air downwardly from said inlet and receiving air directed upwardly toward said outlet,

enclosure means defining an enclosed volume suspended beneath and spaced from said manifold,

first means mounted and extending between said inlet and said enclosure means for directing incoming air downwardly into said enclosed volume, said first means including means adapted to promote coalescence of vapor in air passing therethrough into droplets,

second means mounted and extending between said enclosure means and said outlet for directing air from said enclosed volume to said outlet,

a drain positioned in a lower portion of said enclosed volume for draining liquid collected therein, said drain comprising a drain collar threaded into a lower wall of said enclosure means, a drain cock including a hollow tubular body threaded into said drain collar with a drain passage extending axially through said body and an open orifice at an axial end of said body connecting said passage to said enclosed volume, a lateral opening in said tubular body which cooperates with said drain passage to provide a drain path, and complementary conical seats on said body and collar to seal drainage through said path, drainage through said orifice and passage remaining open, and

a wire extending axially through said passage and through said orifice, a right-angle bend on an end of said wire within said enclosure means for preventing removal of said wire through said orifice, and a T-shaped handle on an end of said wire external to said enclosure volume for facilitating rotation of said wire, said wire being selectively rotatable within said passage and orifice such that said right-angle bend sweeps the end of said orifice which opens into said enclosed volume for removing debris collected at said orifice and thereby unplugging said orifice and passage.

4,600,417

CYCLONE

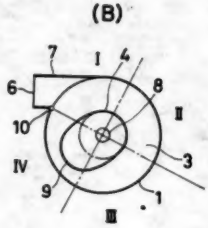
Atsushi Sasaki; Hiromi Ohsaka, both of Hiroshima; Mitsuharu Murakami, Nagoya; Masahiro Harada, Hiroshima; Hirofumi Hatano, Kitakyuushu, and Yoji Hirota, Yokose, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Mining & Cement Co., Ltd., both of, Japan

Filed May 30, 1984, Ser. No. 615,459

Claims priority, application Japan, May 30, 1983, 58-94030

Int. Cl.[4] B01D *45/12*

U.S. Cl. 55—413 **3 Claims**



1. A cyclone comprising a cylindrical portion and an inverted conical portion, the cylindrical portion having a gas inlet connected thereto in its tangential direction and a gas outlet perforated through a ceiling panel thereof, the gas inlet allowing the introduction of a gas including powders therethrough, the inverted conical portion being connected to the cylindrical portion under its lower edge and having a collected powder outlet at the lower end thereof, characterized in that the gas outlet is perforated through the ceiling panel of the cylindrical portion so that the central axis of the gas outlet may be coaxially coincident with the central axis of the cylindrical portion; a cylindrical exhaust gas guide is disposed under the ceiling panel so as to surround the periphery of the gas outlet; and when a cross section of the cylindrical portion is separated into four sectors by an imaginary line passing through an intersection of an inner wall of the gas inlet and the cylindrical portion and passing through the center of the cylindrical portion, and another imaginary line passing through the center of the cylindrical portion and crossing the above-mentioned imaginary line at right angles, and when these four sectors are named a first, a second, a third and a fourth quadrant from the above-mentioned intersection in a gas revolving direction order, the cylindrical exhaust gas guide is formed so that a maximum value of a space between the cylindrical exhaust gas guide and an inner wall of the cylindrical portion may lie in the first quadrant and so that a minimum value of the space therebetween may lie in the fourth quadrant.

4,600,418

AIR-INTAKE ARRANGEMENT FOR A TWO-STROKE ENGINE

Reinhard Gommel; Jürgen Laser, both of Backnang; Klaus Höppner, Marbach; Gerhard Meyer, Kornwestheim; Hans G. Salomon, Dombühl; Günter Wolf, Oppenweiler-Aichelbach; Dieter Wieland, Remseck; Hermann Weiss, Grossbottwar, and Jürgen Wolf, Stuttgart, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jan. 22, 1985, Ser. No. 693,250

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1984, 3424774

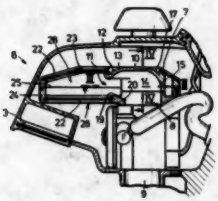
Int. Cl.[4] F02M *17/34*

U.S. Cl. 55—462 **20 Claims**

1. An air-intake arrangement in combination with the engine

of a hand-guided, engine-driven apparatus such as an engine-driven chain saw or the like, the engine being equipped with carburetor means for forming an air-fuel mixture, the carburetor means including an induction channel through which a pulsating flow of air for forming the mixture is drawn by suction developed by the engine and through which the engine periodically reverses the flow of air containing particles of the fuel in a direction opposite to a flow of incoming fresh air thereby causing the fuel particles to pass out through the inlet opening of the induction channel, the air-intake arrangement comprising:

an air filter disposed in said flow of fresh air ahead of said inlet opening; and,



a baffle having a first arcuate wall portion facing said inlet opening and a second arcuate wall portion extending from said first arcuate wall portion, said first arcuate wall portion extending outwardly directly from the peripheral edge of said inlet opening in a continuous uninterrupted manner so as to cause the outermost portion thereof to face said opening, said second arcuate wall portion being configured so as to cause said wall portions to conjointly define a turnaround deflector for receiving the flow of fresh air and for guiding the reversed flow of air containing the fuel particles back toward said carburetor means and said engine.

4,600,419

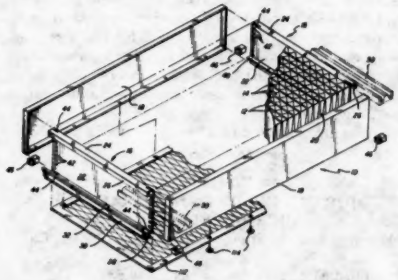
HIGH EFFICIENCY, DOWN FLOW AIR FILTER SEALING AND SUPPORT SYSTEM

Allen H. Mattison, Weedsport, N.Y., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,410

Int. Cl.⁴ B01D *39/08*

U.S. Cl. 55—484 **22 Claims**



1. An assembly of high efficiency air filter units through which essentially all air entering a clean space below said units must pass to remove particulate matter down to sub-micron size from said air, said assembly comprising:

(a) a plurality of air filter units each having a filter core of pleated media sealed in air-tight engagement on four sides to a surrounding, box-like, rigid frame, having side and end members;

(b) means for supporting said filter units adjacent the upper surfaces thereof from structure above said space with adjacent units having said side and end members thereof providing adjoining vertical surfaces in closely spaced relation with the lower surfaces of said units in essentially the same horizontal plane to form at least a portion of the top of said space; and

(c) a caulking material filling all spaces between said adjoining vertical surfaces of adjacent filter units, effectively sealing said spaces and providing the sole means preventing passage of air around said units.

4,600,420

FILTER WITH INTEGRAL STRUCTURAL FRAMEWORK

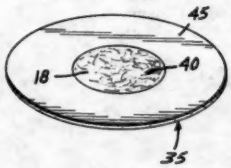
Robert M. Wydeven, Eagan, and Warren Gehl, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 554,828, Nov. 23, 1983, abandoned.

This application Oct. 21, 1985, Ser. No. 790,783

Int. Cl.⁴ B01D *25/06*

U.S. Cl. 55—501 **13 Claims**



11. A self-supporting microfiltration air filter comprising a sheet of fibrous media filter material wherein the perimeter of said fibrous media filter material is solidified by the integral incorporation of impervious resin filler materials so that the fiber structure and thickness of said solidified media is substantially unaltered and undamaged by the filler material at the interface between the solidified perimeter and the active-filtering area, said solidified perimeter framing and providing structural support for said active-filtering area, at least one face of said solidified perimeter providing a substantially solid and impermeable surface which may be adhesively attached to a filter supporting substrate.

4,600,421

TWO-STAGE RECTIFICATION FOR THE SEPARATION OF HYDROCARBONS

Paul Kummann, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 18, 1985, Ser. No. 724,729

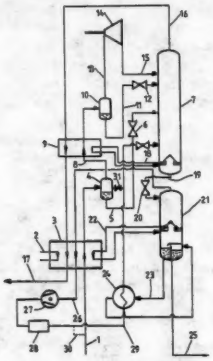
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414749

Int. Cl.⁴ F25J *3/02*

U.S. Cl. 62—25 **22 Claims**

1. In a process for the separation of C_{2+} or C_{3+} hydrocarbons from a hydrocarbon-containing raw gas under pressure, by recitification wherein the raw gas is cooled and expanded and the resultant condensates are introduced into a rectification column wherein the C_{2+} or C_{3+} hydrocarbons, respectively, are separated from the lower-boiling components, the improvement which comprises feeding the condensate fractions produced during cooling and expansion of the raw gas into a first rectifying column operated under a higher pressure to yield a bottoms fraction and an overhead product, the latter containing components boiling lower than the C_{2+} or C_{3+} hydrocarbons, expanding the bottoms fraction and then feeding resultant expanded bottoms fraction into a second rectify-

ing column operating under a lower pressure than the first column, to yield C_{2+} or C_{3+} hydrocarbons bottoms product



and an overhead fraction, compressing the latter overhead fraction and recycling resultant compressed overhead fraction into the first rectifying column.

4,600,422

METHOD FOR MAKING AND COATING OPTICAL FIBRES

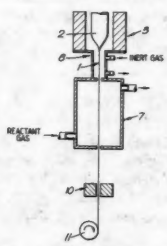
Michael G. Scott, Safron Walden, United Kingdom, assignor to Standard Telephone & Cables, London, England

Filed Mar. 25, 1985, Ser. No. 715,958

Claims priority, application United Kingdom, Mar. 27, 1984, 8407864

Int. Cl.[4] C03B *37/027*; C03C *25/04*

U.S. Cl. 65—3.3 **8 Claims**



1. A method of manufacturing a metallic coated infrared optical fibre, the metal having a melting point greater than the glass transition temperature of the fibre material, the fibre including a core of infrared transmitting glass and a cladding of infrared transmitting glass, including the steps of fabricating the core/cladding structure of the fibre by a method including the application of heat and drawing, and in-line with the fibre fabrication causing, at the surface of the fibre whilst it is still hot from the fabrication thereof, the decomposition or reaction of a volatile compound of the metal, whereby to provide a hermetic coating on the surface of the fibre, which decomposition or reaction takes place at a temperature lower than the glass transition temperature.

4,600,423

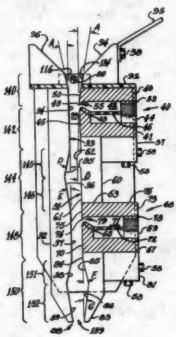
METHOD AND APPARATUS FOR PRODUCING A CONTINUOUS GLASS FILAMENT MAT

David V. Stotler, and Fred S. Coffey, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 1, 1985, Ser. No. 729,456

Int. Cl.[4] C03B *37/06*

U.S. Cl. 65—4.4 **8 Claims**



5. A method of forming a mat of continuous glass filaments comprising:

supplying a plurality of streams of molten glass;

drawing the streams into continuous filaments;

orienting the advancing filaments as an array of substantially parallel bundles of filaments;

directing the array of bundles into a distribution means comprising: a first control surface and a second control surface defining an articulated chamber adapted to receive the array of advancing filaments; a first blower assembly adapted to supply a substantially planar first stream of gas into the chamber along the path of advancement of the bundles; a second blower assembly adapted to supply a substantially planar second stream of gas into the chamber along the path of advancement of the filaments, a portion of the first and second control surfaces having divergent and convergent sections defining a first fluid effect zone in said chamber adapted to create turbulence in said gaseous stream sufficient to disassociate filaments from the bundles, said first fluid effect zone being located intermediate said first blower assembly and said second blower assembly, another portion of the first and second control surfaces having divergent and convergent sections defining a second fluid effect zone in said chamber adapted to laterally extend the gaseous body formed by said first and second gaseous streams sufficient to further separate additional filaments from the bundles and to orient the separated filaments and remaining bundles as a diverging planar array; and

collecting the filaments and bundles to form said mat.

4,600,424

METHOD OF FORMING AN ULTRAFINE MICROPIPETTE

Dale G. Flaming, 2165-G Francisco Blvd., San Rafael, Calif. 94901

Filed Mar. 21, 1985, Ser. No. 714,537

Int. Cl.[4] C03B *23/11*

U.S. Cl. 65—29 **3 Claims**

1. The method of forming a micropipette comprising the steps of:

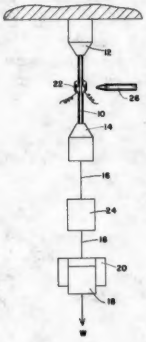
providing a length of glass tubing;

grasping said length of tubing at opposite ends thereof;

applying heat to a portion of said tubing intermediate said

opposite ends and pulling said opposite ends apart under constant light tensile load;

measuring the instantaneous velocity of a moving end of said



tubing as an indication of the viscosity of the glass at said portion of the tubing; and

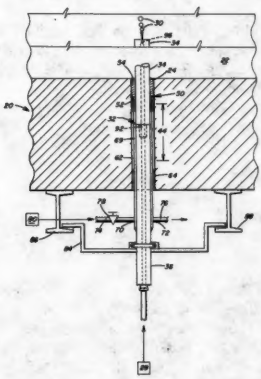
interrupting the application of heat and the pull when the instantaneous velocity reaches a predetermined level.

4,600,425

BUBBLER WITH PROTECTIVE SLEEVE OR FLUID COOLANT JACKET

John F. Krumwiede, Cresaptown, Md.; William G. Hilliard, and Roy M. Sims, both of Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,940
Int. Cl.⁴ C03B *5/193*
U.S. Cl. 65—178 **11 Claims**



1. A bubbler assembly mountable within a mounting hole provided through a refractory wall of a glassmaking furnace containing a body of molten glass, comprising:

a bubbler tube for injecting a gaseous bubbler medium into the body of molten glass;

a sleeve mounted in surrounding relationship to at least a portion of said bubbler tube to define an annular space between the inner surface of said sleeve and the outer surface of said bubbler tube;

upper and lower seal means for rendering said annular space substantially airtight; and,

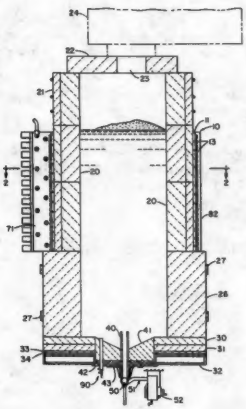
a corrosion-inhibiting gas contained within said annular space.

4,600,426

METERING DEVICE FOR MOLTEN GLASS AND THE LIKE

Ronald L. Schwenninger, Ridgeley, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 1, 1984, Ser. No. 656,293
Int. Cl.⁴ C03B *17/04*
U.S. Cl. 65—330 **9 Claims**



1. Apparatus for controlling the flow of molten material comprising:

a vessel adapted to contain a volume of molten material;

drain orifice means for passing a stream of the molten material from the vessel by means of fluid pressure of the molten material, the orifice means having an interior opening within the vessel and an exterior opening outside the vessel;

flow restricting means coacting with the exterior opening for regulating the rate of flow of the molten material from the vessel, the flow restricting means including a bulbous member in vertical alignment with the exterior opening having downwardly converging surfaces at its bottom portion and a support arm extending from a side of the bulbous member outside of the vessel, the arm having a portion adjacent to the bulbous member downwardly inclining toward the bulbous member, and means engaging the arm for adjusting the elevation of the arm and the the bulbous member.

4,600,427

METHOD OF LADLE STEELMAKING AND PRODUCT PRODUCED THEREBY

Albert L. Lehman, Glenview, and Charles W. Finkl, Evanston, both of Ill., assignors to A. Finkl & Sons Co., Chicago, Ill.

Filed Oct. 22, 1984, Ser. No. 663,808
Int. Cl.⁴ C21C *7/10*
U.S. Cl. 75—49 **13 Claims**

1. In a method of refining molten steel the steps of

providing a layer of fluid slag having the capability of decreasing the sulfur content of the steel,

subjecting the molten steel, including the slag, to a sub-atmospheric pressure sufficiently low to decrease the hydrogen content of the steel,

agitating the molten steel simultaneously with subjection to the sub-atmospheric pressure,

the degree of agitation being sufficiently violent to cause

portions of molten steel to be projected from the surface region of the molten steel upwardly through the molten steel and fluid slag and into the vacuum environment there above prior to returning to the molten steel through the fluid slag, and

adding heat to the molten steel at a time when the molten steel is simultaneously subjected to a vacuum and agitation,

the slag layer being substantially entirely fluid during the time when portions of the molten steel pass upwardly there through and return,

said slag layer being a low melting point slag during the period sulfur and hydrogen removal takes place.

4,600,428
N-(CYCLOPROPYL-PYRIMIDINYL-N'-(ARYL-SULFONYL) UREAS HAVING HERBICIDAL ACTIVITY

Henry Szczepanski, Wallbach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

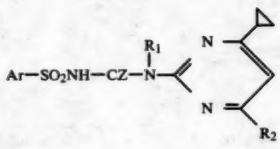
Division of Ser. No. 535,527, Sep. 26, 1983, Pat. No. 4,515,626. This application Jan. 22, 1985, Ser. No. 693,655

Claims priority, application Switzerland, Oct. 6, 1982, 5874/82

Int. Cl.[4] **A01N** *43/54;* **C07D** *239/42*

U.S. Cl. 71—76 **12 Claims**

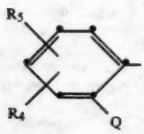
1. An N-(cyclopropyl-pyrimidinyl)-N'-(arylsulfonyl)urea of the formula I



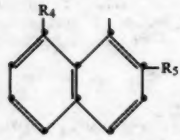
(I)

wherein

Ar is a phenyl group



or a naphthyl group



and

Q is a group X-A or R_3,

A is a C_3–C_6 -alkynyl group, a C_1–C_6-alkyl group which is unsubstituted or substituted by halogen, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulfinyl, C_1–C_4-alkylsulfonyl, C_1–C_4-haloalkoxy, C_1–C_4-haloalkylthio, C_1–C_4-haloalkylsulfinyl or C_1–C_4-haloalkylsulfonyl, or a C_2–C_6-alkenyl group which is unsubstituted or substituted by the groups given in the foregoing for C_1–C_6-alkyl, or A is a phenyl or benzyl group,

X is oxygen, sulfur, or a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

R_1 is hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R_2 is halogen, C_1–C_3-alkyl, C_1–C_3-haloalkyl, C_1–C_3-alkoxy, C_1–C_3-haloalkoxy, amino, C_1–C_3-alkylamino, di-(C_1–C_3-alkyl)amino, C_3–C_6-cycloalkyl or C_2–C_6-alkoxyalkyl,

R_3 is hydrogen, halogen, C_1–C_5-alkyl, C_2–C_5-alkenyl, C_1–C_4-haloalkyl, —$COZR_{11}$, —NO_2, —CO—NR_8R_9, —CN, —COR_{10}, —NR_1R_7 or —NR_1—COR_{12},

R_4 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, halogen, or alkoxyalkyl having at most 4 carbon atoms,

R_5 is the same as R_3 but independent thereof, or —X—R_6,

R_6 and R_7 are each C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl,

R_8 and R_9 independently of one another are each hydrogen, C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl,

R_{10} is hydrogen, C_1–C_4-alkyl or C_1–C_3-haloalkyl,

R_{11} is hydrogen, C_1–C_4-alkyl, C_1–C_3-haloalkyl, C_3–C_5-alkenyl, C_3–C_5-alkynyl, phenyl or benzyl, and

R_{12} is the same as R_1 but independent thereof.

9. A method of controlling undesirable plant growth, which method comprises applying thereto or to the locus thereof an effective amount of an N-(cyclopropyl-pyrimidinyl)-N'-(arylsulfonyl)-urea according to claim 1.

4,600,429
GUANIDATED AMINOPHOSPHONIC ACID COMPOUNDS

David G. Cameron, Stockholm, Sweden; Harry R. Hudson, London, England; Inger Lagerlund, Bromma, Sweden; Max Pianka, Wembley Park, England, and Anita Stroömberg, Saltsjöbaden, Sweden, assignors to KenoGard AB, Stockholm, Sweden

PCT No. PCT/SE84/00224, § 371 Date Jan. 18, 1985, § 102(e) Date Jan. 18, 1985, PCT Pub. No. WO85/00038, PCT Pub. Date Jan. 3, 1985

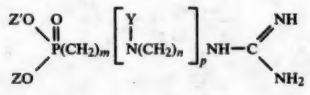
PCT Filed Jun. 15, 1984, Ser. No. 705,342

Claims priority, application Sweden, Jun. 17, 1983, 8303499-1

Int. Cl.[4] **C07F** *9/38, 9/40;* **A01N** *31/02*

U.S. Cl. 71—86 **5 Claims**

1. Guanidated N-(aminoalkyl)aminoalkanephosphonic acid derivatives having the general formula



wherein Z and Z', which may or may not be equal, are hydrogen, a lower alkyl group having 1 to 4 carbon atoms or an alkali metal, Y is hydrogen or an amidine group, m is 1 to 3, n is 4 to 16 and p is 1 to 3, or their acid addition salts.

5. Use of guanidated N-(aminoalkyl)aminoalkanephosphonic acid derivatives having the general formula

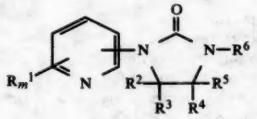
wherein Z and Z', which may or may not be equal, are hydrogen, a lower alkyl group having 1 to 4 carbon atoms or an alkali metal, Y is hydrogen or an amidine group, m is 1 to 3, n is 4 to 16 and p is 1 to 3, or their acid addition salts, as biocides.

4,600,430
PYRIDINYLIMIDAZOLIDINONE COMPOUNDS

Riaz F. Abdulla, Greenfield, and Jack G. Samaritoni, Knightstown, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 22, 1985, Ser. No. 704,236
Int. Cl.[4] A01N *43/40;* **C70D** *401/04*
U.S. Cl. 71—92 **12 Claims**

1. A compound of the formula (I)



(I)

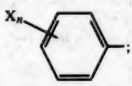
wherein

R^1 is halogen, C_1–C_6 alkyl, or halo(C_1–C_6 alkyl);

R^2 is hydrogen, hydroxy, or

wherein

R^7 is C_1–C_6 alkyl or



X is halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, or halo(C_1–C_6 alkyl);

R^3 is hydrogen or C_1–C_6 alkyl;

R^4 is hydrogen or hydroxy;

R^5 is hydrogen or C_1–C_6 alkyl;

R^6 is hydrogen or C_1–C_6 alkyl; and

m and n are integers from 0 to 2.

4,600,431
N-PYRIMIDYL ARYLOXYPHENOXY ALKANOIC ACID AMIDES AND METHODS OF USE

Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 17, 1984, Ser. No. 651,409
Int. Cl.[4] A01N *43/54;* **C07D** *239/42*
U.S. Cl. 71—92 **3 Claims**

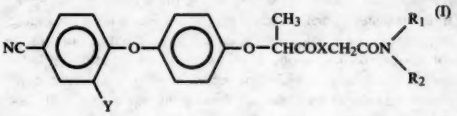
3. A method for controlling undesirable weed pests which comprising applying to the locus wherein control is desired a herbicidally effective amount of 2-[2'(4''-(5'''-trifluoromethylpyridyl-2'''-oxy)phenoxy)propionamido]-4,6-dimethylpyrimidine.

4,600,432
PROPIONIC ACID DERIVATIVES AND HERBICIDES EMPLOYING THEM

Rokuro Akahira, Kurume; Shinzo Someya, Tokorozawa; Mikio Ito, Tokuyama; Akira Nakanishi, Shinnanyo, and Yuji Nonaka, Tokuyama, all of Japan, assignors to Agro-Kanesho Co., Ltd., Tokyo and Toyo Soda Manufacturing Co., Ltd., Shinnanyo, both of, Japan

Filed Jul. 25, 1985, Ser. No. 758,701
Claims priority, application Japan, Jul. 25, 1984, 59-155055; Jun. 24, 1985, 60-137286
Int. Cl.[4] A01N *43/40, 37/34;* **C07C** *121/78*
U.S. Cl. 71—94 **2 Claims**

1. Propionic acid derivatives represented by the formula (I)



(I)

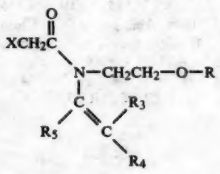
wherein X indicates an oxygen atom or a sulfur atom, Y indicates a hydrogen atom or a halogen atom, R_1 and R_2 are the same or different group, indicating an alkyl group, alkenyl group, alkynyl group, cycloalkyl group, lower alkoxy group, lower alkoxyalkyl group, phenyl group, respectively, or R_1 and R_2 may form a heterocyclic group together with a nitrogen atom bonding to said R_1 and R_2.

4,600,433
HERBICIDAL 2-HALOACETAMIDES

Gerhard H. Alt, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 25, 1980, Ser. No. 133,760
Int. Cl.[4] A01N *37/18, 43/08;* **C07D** *307/54, 209/34*
U.S. Cl. 71—118 **12 Claims**

5. Herbicidal compositions comprising an adjuvant and a herbicidally effective amount of a compound having the formula



wherein

X is chlorine, bromine or iodine;

R is $C_{1\text{-}10}$ lower alkyl;

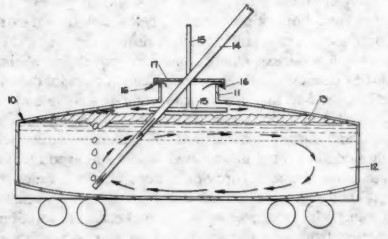
R_3 and R_4 are hydrogen, $C_{1\text{-}6}$ alkyl, benzyl or phenyl; and

R_5 is $C_{1\text{-}6}$ lower alkyl, tetrahydrofuryl, phenyl or phenyl substituted with lower alkyl or halogen; provided that not more than two of R_3, R_4 and R_5 members are hydrogen or alkyl.

4,600,434
PROCESS FOR DESULFURIZATION OF FERROUS METAL MELTS

David L. Kleimeyer, Russell; Larry N. Fletcher; Alan D. Stacy, both of Ashland, all of Ky., and Allan M. Smillie, Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Jul. 24, 1985, Ser. No. 758,516
Int. Cl.[4] C21C *7/02*
U.S. Cl. 75—58 **24 Claims**



1. In a process of desulfurizing a molten ferrous metal charge

by magnesium addition prior to refining said charge in an oxygen steel converter, wherein said molten charge is tapped into a transfer vessel, emptied therefrom into a ladle for charging into said converter, and magnesium is added to said charge for desulfurization in one of said transfer vessel and said ladle, the improvement which comprises adding a calcium compound to said charge, adding fluxing agents along with said calcium compound in an amount sufficient to dissolve said calcium compound and to form with silica in said charge a fluid, high sulfur capacity slag wherein the weight ratio of calcium oxide to silica plus at least one of Al_2O_3 and MgO is greater than 0.8, thereafter adding magnesium to said charge, and causing sulfur removed from said charge by said magnesium addition to be transferred to and retained by said slag.

4,600,435

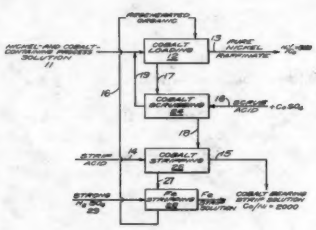
SOLVENT EXTRACTION OF COBALT (II) FROM SULFATE SOLUTIONS WITH COBALT EXTRACTANTS

Ben W. Wiegers, Wilmer, Ala.; Eddie C. J. Chou, Arvada, Colo.; John D. Bruno, Golden, Colo., and Helen S. Leaver, Pine, Colo., assignors to AMAX Inc., Greenwich, Conn.

Filed Aug. 24, 1984, Ser. No. 643,998

Int. Cl.[4] C22B *23/04*

U.S. Cl. 75—119 9 Claims



1. In the process for separating nickel and cobalt contained in an aqueous nickel sulfate solution by countercurrent solvent extraction using an organic cobalt-selective extractant of low water solubility wherein apparatus employed for conducting said process becomes coated on the contacting surfaces thereof with scale deposits due to alkaline earth metal ions present in the solutions being treated, the improvement for inhibiting said scale formation which comprises contacting said nickel sulfate solution containing no more than 4 gpl magnesium and no more than 0.4 gpl calcium at a pH below 5 with said extractant to produce a purified nickel sulfate raffinate having a pH above 5 and a loaded extractant containing cobalt, scrubbing said loaded extractant with an acidic cobalt sulfate solution having a pH below 5 to produce a scrub raffinate having a pH higher than 5 and to scrub coextracted nickel from said loaded organic, and stripping cobalt and said alkaline earth metal ion from said loaded organic with an acid solution to recover said organic for reuse, to provide a cobalt strip solution low in nickel and thereby minimize cobalt recycle, with said magnesium and calcium contained in said nickel sulfate solution being removed from said extraction circuit as constituents of said nickel raffinate and said cobalt strip solution, thereby minimizing scale formation on said contact surfaces.

4,600,436

DURABLE SILICONE EMULSION POLISH

Frank J. Traver, Troy; Raymond J. Thimineur, Scotia, and Anthony A. Zotto, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 424,260, Sep. 27, 1982. This application May 22, 1984, Ser. No. 613,112

Int. Cl.[4] C09G *1/06*

U.S. Cl. 106—3 58 Claims

1. A composition comprising an aqueous emulsion prepared by

(A) emulsion polymerizing
  (a) a polydiorganosiloxane in
  (b) an aqueous medium in the presence of
  (c) an emulsifier or mixture of emulsifiers and
  (d) optionally, a polymerization catalyst or mixture of polymerization catalysts, and

(B) thereafter stripping cyclic or other low molecular weight siloxanes from said emulsion by heating.

4,600,437

INORGANIC MATERIAL, A PROCESS FOR PRODUCING SAME AND A SOLIDIFYING METHOD THEREOF

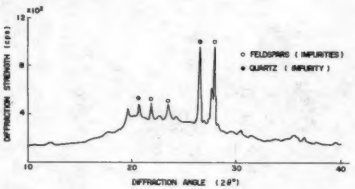
Masahiro Sugiura; Yoshiaki Fukushima; Hiroaki Hayashi; Mitsumasa Horii; Takako Kurimoto, and Kazuhiro Fukumoto, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagakute, Japan

Filed Mar. 26, 1985, Ser. No. 716,144

Claims priority, application Japan, Mar. 29, 1984, 59-62566; Mar. 30, 1984, 59-63479

Int. Cl.[4] C09D *1/02*

U.S. Cl. 106—74 13 Claims



1. Inorganic material having high water resistance when solidified, which comprises a mixture of water glass and metakaolin obtained by heat treating a kaolin group clay mineral selected from the group consisting of kaolinite, dickite, narcrite, metahalloysite, halloysite and mixtures thereof at a temperature ranging from 600° to 900° C.

4,600,438

CO-PRODUCTION OF CEMENTITIOUS PRODUCTS

Philip H. Harris, Arlington, Tex., assignor to Texas Industries, Inc., Dallas, Tex.

Division of Ser. No. 473,535, Mar. 9, 1983, abandoned, which is a continuation-in-part of Ser. No. 326,614, Dec. 2, 1981, abandoned. This application Nov. 9, 1984, Ser. No. 669,848

Int. Cl.[4] C04B *7/44*

U.S. Cl. 106—100 24 Claims

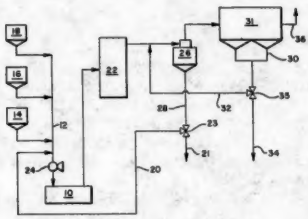
1. A method of thermally reacting one or more inorganic materials at a predetermined reaction temperature comprising:

(a) maintaining a flame in a combustion zone at said predetermined reaction temperature by passing effective combustion quantities of a fluid stream comprising a hydrocarbon fuel and oxygen into said flame;

(b) comminuting said inorganic materials to a predetermined particle size sufficient to be transported by gas flow; and

(c) suspending said comminuted particles of said inorganic compounds in intimate contact with said hydrocarbon fuel

and said oxygen within said fluid stream, and passing said fluid stream to the interior of said flame to thereby effect



said thermal reaction of said particulate inorganic material therewithin.

4,600,439

COMPOSITION AND PROCESS FOR COATING PAPER AND CARDBOARD PROCESS FOR PREPARING THE COMPOSITIONS AND PAPER AND CARDBOARD SO OBTAINED

Jean Schneider, La Gorgue; Serge Gosset, Lestrem, and Pierre Lefer, Merville, all of France, assignors to Roquette Freres, France

Filed Oct. 12, 1983, Ser. No. 541,236
Claims priority, application France, Oct. 12, 1982, 82 17085
Int. Cl.[4] C08L *89/00*; B32B *23/04*
U.S. Cl. 106—139 **7 Claims**

1. Aqueous coating composition for paper and cardboard, having a dry matter content of at least 53%, comprising

pigment,

binding agent comprising from 0.2 to 30% by weight, with respect to the pigment, of one or several undepolymerized starches and

at least one hydrogenated sugar selected from the group consisting of sorbitol, mannitol, maltitol, xylitol, lactitol and hydrogenated starch hydrolysates, the proportions of hydrogenated sugar being from 0.40 to 20 parts by weight per 100 parts of pigment.

4,600,440

WATER WASH-UP COATING COMPOSITION

Alfredo L. Guevarra, Vallejo, and Fredrick J. Connelly, San Leandro, both of Calif., assignors to The Flecto Company, Inc., Oakland, Calif.

Filed Dec. 11, 1984, Ser. No. 680,427
Int. Cl.[4] C08L *3/00, 91/00*
U.S. Cl. 106—211 **18 Claims**

1. In a paint formulation containing a blend of miscible polysaccharide resin and vegetable oil based resin wherein the weight ratio of polysaccharide resin to vegetable oil based resin ranges from about 25:75 to 75:25, the improvement wherein the paint formulation contains an effective amount of hydrophilic and lypophilic surfactants to render the paint water wash-up.

4,600,441

OIL AND DIRT REPELLENT ALKYD PAINT

Newton N. Goldberg, Penn Hills Township, Allegheny County, and John S. Hudock, Hempfield Township, Mercer County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 21, 1985, Ser. No. 714,608
Int. Cl.[4] C09D *3/26, 7/00*
U.S. Cl. 106—253 **6 Claims**

1. An air-drying alkyd paint consisting essentially of:

(A) 100 parts by weight of a solvent solution of an alkyd paint vehicle reaction product component consisting essentially of:

(1) about 20 wt. % to about 85 wt. % of a drying component;

(2) about 10 wt. % to about 35 wt. % of a hydroxyl component consisting essentially of:

(a) 70 wt. % to 98 wt. % of a fluorine-free polyol, and

(b) 2 wt. % to 30 wt. % of a fluorinated aliphatic monohydric alcohol having the structural formula $F(CF_2)_n—(CH_2)_m—OH$, where n is an integer from 4 to 12 and m is an integer from about 2 to about 12,

(3) about 10 wt. % to about 50 wt. % of a polycarboxylic acid; and

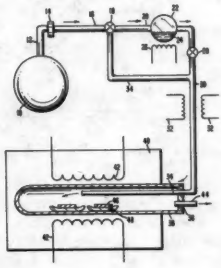
(B) about 15 parts by weight to about 60 parts by weight of a coloring pigment component.

4,600,442

PROCESS FOR THE REMOVAL OF IMPURITIES FROM OPTICAL COMPONENT MATERIALS

Ricardo C. Pastor, Manhattan Beach, and Luisa E. Gorre, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 14, 1984, Ser. No. 640,724
Int. Cl.[4] C03C *23/00*
U.S. Cl. 134—2 **7 Claims**



1. A process for the removal of water and water derived impurities substitutionally or interstitially incorporated in the structures of crystalline and amorphous optical materials consisting of metal oxides, comprising heating the optical material to a temperature of greater than 1000° C., and thereafter exposing the heated optical material at said temperature to a gas phase reactive atmosphere containing a mixture of a halogen and carbon monoxide for a period of time, the molar amount of carbon monoxide is substantially greater than the stoichiometric amount necessary for carbon monoxide to react with halogen to form carbonyl halide, the amounts of carbon monoxide and halogen being sufficient to react with the water and water derived impurities surrounding and within the optical material to reduce the impurities to an extremely low level.

4,600,443

PROCESS FOR REMOVING SURFACE OXIDES FROM A COPPER-BASE ALLOY

Peter I. Basalyk, Parma; Dorothy Lukco, Macedonia; J. Robert Mooney, South Russell, and Dexter C. Seifert, Lyndhurst, all of Ohio, assignors to Kennecott Corporation, Cleveland, Ohio

Filed Oct. 1, 1984, Ser. No. 656,308
Int. Cl.[4] C23G *1/02, 1/14*
U.S. Cl. 134—3 **18 Claims**

1. A process for removing surface oxides from a copper-base alloy, the process comprising:

(a) contacting the alloy surface with an aqueous solution comprising potassium ions; and

(b) subsequently contacting the alloy surface with an aqueous solution comprising an acid, a peroxide, and a metal oxide

where the metal of the oxide is molybdenum, the solution having:

(i) an acid equivalent of a sulfuric acid solution of about 4 to 30 percent by volume;

(ii) a peroxide concentration of about 1 to 30 percent by volume; and

(iii) a metal oxide concentration of about 0.1 to 5 percent by volume

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4,600,444

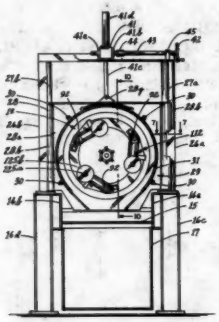
PIPE END AREA CLEANING SYSTEM

Robert M. Miner, 1855 Glendale Ave., Casper, Wyo. 82609

Filed May 30, 1984, Ser. No. 615,341

Int. Cl.[4] B08B *9/02*

U.S. Cl. 134—8 **31 Claims**



1. Apparatus for cleaning pipe and tubing comprising

a first cleaning unit;

a generally longitudinally extending mandril located within said first cleaning unit; means for rotating said mandril drivably connected to said mandril;

at least one internal cleaning brush removably mounted upon said mandril; said internal cleaning brush rotatable with said mandril;

at least one external cleaning brush laterally spaced from said mandril;

means for placing said mandril in driving engagement with said external cleaning brush for rotating said external cleaning brush;

means for moving pipe or tubing longitudinally relative to said first cleaning unit internal and external brushes whereby the internal surface of the pipe or tubing engages said first cleaning unit internal brush, and the external surface of said pipe or tubing engages said first cleaning unit external brush, and whereby rotation of said first cleaning unit internal and external brushes relative to said pipe or tubing causes a cleaning action upon the pipe or tubing; and

means for moving the pipe or tubing away from said first internal and external cleaning brushes after said cleaning operation has been completed.

25. A method of cleaning tubing and pipe comprising:

providing at least one generally longitudinally extending mandril located at a first end of pipe or tubing to be cleaned;

removably attaching at least one internal cleaning brush to said mandril;

locating at least one external cleaning brush laterally spaced from said mandril, but in driving engagement therewith; rotating said mandril and thereby said internal cleaning brush, and said external cleaning brush;

moving the pipe longitudinally relative to said internal and external brushes, whereby the internal surface of the pipe or tubing engages the first internal brush and the external surface of the pipe or tubing engages the external brush, and whereby the rotative action of the internal and external brushes causes a cleaning of the pipe or tubing, and moving the pipe or tubing away from the internal and external brushes after the cleaning operation has been completed.

4,600,445

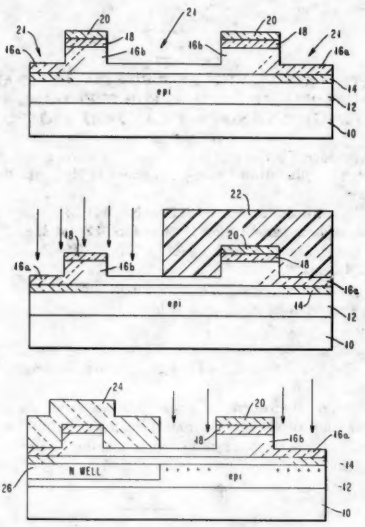
PROCESS FOR MAKING SELF ALIGNED FIELD ISOLATION REGIONS IN A SEMICONDUCTOR SUBSTRATE

Robert A. Horr, Fairfax, and Rick L. Mohler, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1984, Ser. No. 650,389

Int. Cl.[4] H01L *21/22, 21/265*

U.S. Cl. 148—1.5 **12 Claims**



1. A process of making a semiconductor structure comprising:

providing a semiconductor body;

forming on a surface of said semiconductor body a first masking layer from a material preselected to be impervious to oxygen diffusion therethrough;

defining on said first masking layer the position of active and field isolation regions to be subsequently formed on said semiconductor body, by partially removing portions of said layer from areas defined for the field isolation regions to thereby establish in said layer relatively thick portions over the positions of said active regions and relatively thin portions over the positions of said field isolation regions;

forming and patterning a second masking layer which exposes a first portion of said first masking layer;

implanting dopant ions to form first doped regions in portions of said semiconductor body beneath said relatively thin portions of said portion of said first masking layer exposed by said second masking layer;

forming and patterning a third masking layer which exposes a second portion of said first masking layer; and

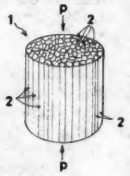
implanting dopant ions to form second doped regions in portions of said semiconductor body beneath said relatively thin portions of said portion of said first masking layer exposed by said third masking layer.

4,600,446

METHOD FOR TEMPERING AND WORKING HIGH STRENGTH LOW DUCTILE ALLOY

Yasunori Torisaka; Kiyoyuki Ohuchi, and Yoshinori Nakazawa, all of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,248
Claims priority, application Japan, Oct. 8, 1983, 58-188908
Int. Cl.[4] C21D *9/52*
U.S. Cl. 148—2 23 Claims



1. A method for tempering and working a high-strength, low ductile alloy, comprising the steps of:

providing a plurality of fine wires, fabricated from said high-strength, low ductile alloy, such that the surface of each of said plurality of fine wires defines an obstacle region, to grain growth, oriented in the direction of the length of each of said fine wires;

bundling said multiplicity of fine wires together;

consolidating and forming said bundle of fine wires into a prescribed shape so as to fabricate a formed product;

subjecting said formed product to thermal treatment at the temperature of primary recrystallization whereby the interior regions of said fine wires form aggregates of very fine grains; and

subsequently subjecting said formed product to thermal treatment at the temperature of secondary recrystallization whereby said very fine grains are enabled to grow along said obstacle regions.

4,600,447

AFTER-PASSIVATION OF PHOSPHATED METAL SURFACES

Reinhard Opitz, Dueren; Kurt Hosemann, Titz-Roedingen, and Heinz Portz, Roesrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,769
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1984, 3400339
Int. Cl.[4] C23C *22/83*
U.S. Cl. 148—6.15 R 20 Claims

1. A process for the after-passivation of clean phosphated metal surfaces consisting essentially of:

rinsing said clean phosphated metal surface with water;

treating said rinsed surface with an acid to neutral pH aqueous solution containing: about 0.01 to 10 g/l each of at least one cation selected from tetravalent titanium or divalent manganese, cobalt, nickel or copper, each said cation being present in the form of a water soluble salt with an organic anion and the total cation concentration not exceeding 10 g/l; and water q.s.; said solution being at a temperature of about 20° to 120° C.; said treatment exposure time being about 30 to 90 seconds;

after-rinsing said treated surface with low-ion-containing water; and

drying said rinsed surface.

4,600,448

COPPER-TANTALUM ALLOY

Frederick A. Schmidt; John D. Verhoeven, and Edwin D. Gibson, all of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 500,102, Jun. 1, 1983, Pat. No. 4,481,030.
This application Jul. 31, 1984, Ser. No. 636,430
Int. Cl.[4] C22C *9/00*
U.S. Cl. 148—407 2 Claims

1. A cast tantalum-copper alloy wherein the alloy contains up to about 50 weight percent tantalum.

4,600,449

TITANIUM ALLOY (15V-3CR-3SN-3AL) FOR AIRCRAFT DATA RECORDER

Kenneth W. White, Issaquah, and William F. Spurr, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jan. 19, 1984, Ser. No. 572,228
Int. Cl.[4] C22F *1/18;* C22C *14/00*
U.S. Cl. 148—407 14 Claims

1. A flight data recorder housing comprising a titanium alloy consisting essentially of

Element	Weight percent (wt. %)
V	14 to 16
Cr	2.5 to 3.5
Sn	2.5 to 3.5
Al	2.5 to 3.5
O_2	0.13 max
N_2	0.03 max
C	0.03 max
H_2	0.015 max
Fe	0.30 max
Y	0.005 max
Residual elements, each	0.10 max
Residual elements, total	0.30 max
Ti	Balance,

said housing having been simultaneously formed and solution heat treated at an elevated temperature, said alloy having been aged to an ultimate tensile strength less than 200 ksi.

8. A method for preparing a flight data recorder housing comprising a titanium alloy exhibiting high strength and fracture toughness wherein said alloy consists essentially of

Element	Weight percent (wt. %)
V	14 to 16
Cr	2.5 to 3.5
Sn	2.5 to 3.5
Al	2.5 to 3.5
O_2	0.13 max
N_2	0.03 max
C	0.03 max
H_2	0.015 max
Fe	0.30 max
Y	0.005 max
Residual elements, each	0.10 max
Residual elements, total	0.30 max
Ti	Balance,

said method comprising the steps of:

a. formulating said alloy and creating an ingot,

b. forging said ingot and rolling sheet stock therefrom,

c. simultaneously solution treating and forming a flight data recorder housing from said sheet stock at an elevated temperature, and

d. aging said alloy to an ultimate tensile strength level less than 200 ksi.

4,600,450

MICROKNIT COMPOSITE EXPLOSIVES AND PROCESSES FOR MAKING SAME

Harvey A. Jessop, Lehi; M. Taylor Abegg, Salt Lake City; John A. Peterson, Brigham City; Jay W. Butler, Bountiful, all of Utah; Ronald F. McCormick, Wilmslow, England, and Ormond F. Lavery (personal representative of said Harvey A. Jessop, deceased), assignors to Megabar Explosives Corporation, Ogden, Utah

Filed Feb. 8, 1984, Ser. No. 578,177
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.3 40 Claims

1. An arrangement of matter which is a solid, microcrystalline explosive, propellant or gas generator, comprising in combination:

an essentially anhydrous mixture of surfactant(s), hydrocarbon fuel(s) and inorganic oxidizer salt(s), including at least one such salt which is not a nitrate salt, involving the intimate mixing or dissolving of ingredients while they are in the molten state, the intimately mixed fluid having the property of permitting the molten salt(s) to be supercooled before the occurrence of crystal nucleation and reversion from the fluid state and wherein moisture present is water of hydration or because of the hygroscopic nature of said oxidizer salts and is limited to 3% maximum by weight of the composition.

4,600,451

PERCHLORATE BASED MICROKNIT COMPOSITE EXPLOSIVES AND PROCESSES FOR MAKING SAME

Harvey A. Jessop, Lehi; M. Taylor Abegg, Salt Lake City; John A. Peterson, Brigham City; Jay W. Butler, Bountiful, all of Utah; Ronald F. McCormick, Wilmslow, England, and Ormand F. Lavery (personal representative of said Harvey A. Jessop, deceased), assignors to Megabar Explosives Corporation, Ogden, Utah

Filed Feb. 8, 1984, Ser. No. 578,178
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.3 28 Claims

1. An arrangement of matter which is a solid, perchlorate based, microcrystalline explosive, propellant or gas generator, comprising in combination as essentially anhydrous mixture of surfactant(s), hydrocarbon fuel(s) and inorganic oxidizer salt(s), involving the mixing or dissolving of ingredients while they are in the molten state, the intimately mixed fluid having the property of permitting the molten salt(s) to be supercooled before the occurance of crystal nucleation and reversion from the fluid state and wherein moisture which may be present is water of hydration or because of the hygroscopic nature of said oxidizer salts and is limited to 3% maximum by weight of the composition.

4,600,452

EUTECTIC MICROKNIT COMPOSITE EXPLOSIVES AND PROCESSES FOR MAKING SAME

Harvey A. Jessop, Lehi; M. Taylor Abegg, Salt Lake City; John A. Peterson, Brigham City; Jay W. Butler, Bountiful, all of Utah; Ronald F. McCormick, Wilmslow, England, and Ormond F. Lavery (personal representative of said Harvey A. Jessop, deceased), assignors to Megabar Explosives Corporation, Ogden, Utah

Filed Feb. 8, 1984, Ser. No. 578,179
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.3 29 Claims

1. An arrangement of matter which is a solid, microcrystalline explosive, propellant or gas generator, comprising in combination:

an essentially anhydrous mixture of ammonium nitrate and soluble explosives(s), surfactant(s), hydrocarbon fuel(s) and other inorganic oxidizer salt(s), including at least one such salt which is not a nitrate salt, involving the intimate mixing or dissolving of ingredients while they are in the molten state, the intimately mixed fluid having the property of permitting the molten salt(s) to be supercooled before the occurrence of crystal nucleation and reversion from the fluid state and wherein moisture which may be present is water of hydration or because of the hygroscopic nature of said oxidizer salts or explosive and is limited to 3% maximum by weight of the composiition.

4,600,453

NITRATE ESTER MONOPROPELLANT

Barry D. Allan, Huntsville, Ala., and Porter H. Mitchell, Fayetteville, Tenn., assignors to The United Stated of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 21, 1985, Ser. No. 789,816
Int. Cl.[4] C06B *47/08*
U.S. Cl. 149—36 5 Claims

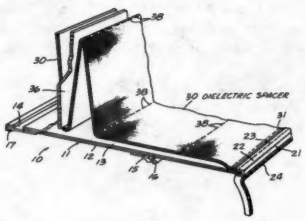
1. A nitrate ester monopropellant comprising hydrazine in combination with an additive effective in lowering the freezing point and raising the specific impulse of said combination, said nitrate ester monopropellant combination comprising hydrazine in a weight percent from about 65 to about 95 and a nitrated pentaerythritol in a weight percent from about 5 to about 25 selected from the group consisting of the mono-, di-, tri-, and tetra-nitrated pentaerythritols.

4,600,454

METHOD OF MAKING AND USING A SHIELDED RE-ENTERABLE JACKET WITH DIELECTRIC SPACER

Walter A. Plummer, 14831 Foxcroft Rd., Tustin, Calif. 92680

Division of Ser. No. 587,590, Mar. 8, 1984, Pat. No. 4,572,922.
This application Apr. 15, 1985, Ser. No. 723,499
Int. Cl.[4] H01B *13/22*
U.S. Cl. 156—55 6 Claims



6. That method of preventing cross talk between a plurality of generally parallel conductors when installed in activated signal circuits which method comprises separating at least certain of said conductors from one another by a dielectric plastic mesh spacer having a multiplicity of closely spaced apart substantially unobstructed air passages each opening through the opposite sides thereof and which dielectric spacer has an effective thickness of at least 35 mils.

4,600,455

METHOD FOR BONDING A THIN SHEET TO A RIGID BODY

Robert J. Doherty, Lakeville, Mass., and Joseph J. Allan, Hyattsville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

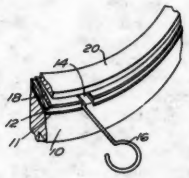
Filed Jul. 25, 1984, Ser. No. 634,344
Int. Cl.[4] B32B *31/00*; B30B *1/38, 15/34*
U.S. Cl. 156—64 2 Claims

1. A method for bonding a plurality of thin metal sheets to a bearing ring having a plurality of detents comprising the steps of:

applying adhesive for bonding to a surface of at least one of said bearing ring and a said plurality of thin metal sheets;

contacting said plurality of thin metal sheets to said bearing

ring with each of said metal sheets located between successive detents and one end of each of said metal sheets abutting a detent;
placing a gage wire between the other end of each of said metal sheets and respective detents;
placing a spreader bar over said contacted surfaces;
connecting temperature monitoring probes to said thin metal sheets;
clamping said bearing ring, then metal sheets and spreader



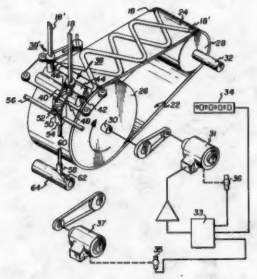
bar together with a clamp having pneumatic cylinders with extensible ends for compressing the elements to be bonded; and
connecting heating elements to said clamped elements;
applying pressurized gas to said pneumatic cylinders for compressing the clamped elements;
removing said gage wire placed between the other end of each of said metal sheets and respective detents;
applying heat to said clamped elements for curing said adhesive.

4,600,456

METHOD AND APPARATUS FOR FORMING WOVEN ENDLESS TIRE REINFORCING BELTS

Richard W. Oswald, Madison, Conn., assignor to Armstrong Rubber Company, New Haven, Conn.

Filed Aug. 2, 1984, Ser. No. 637,386
Int. Cl.[4] B65H *81/08*
U.S. Cl. 156—117 **9 Claims**



1. Apparatus for forming a woven endless tire reinforcing belt by laying coated continuous cord reinforcement on an endless weaving surface in a zig-zag pattern to weave said belt thereon, comprising: an endless weaving surface; reinforcement guide means for supplying cord reinforcement to said endless weaving surface; means comprising a plurality of support members rotatable about spaced parallel axes, for continuously moving said endless weaving surface in a closed loop about said axes; and means for reciprocating said guide means in timed relationship with said support members along a path parallel to said axes to effect the laying of said cord reinforcement on said surface in a zig-zag pattern.

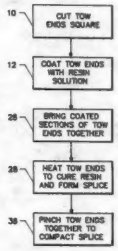
8. A method for weaving an endless tire reinforcement belt of a predetermined circumference from coated continuous cord reinforcement, comprising: supporting an endless weaving surface, comprising a flexible belt having a perimeter effective to produce a reinforcing belt of the predetermined circumference and a width greater than that of the reinforcing belt to be woven, about a plurality of support members which are rotatable about spaced parallel axes; and laying coated continuous cord reinforcement on said endless weaving surface in a zig-zag pattern, said cord being positioned across said surface from one side to the other, at an angle to the edges of the belt with reversals at the edges, and lengths of said cord reinforcement between reversals being interleaved with lengths disposed at an opposite angle along at least one line substantially parallel to and intermediate the edges of said belt being formed, to thereby form a woven endless tire reinforcing belt.

4,600,457

METHOD AND RESIN SOLUTION FOR SPLICING CARBONIZED POLYACRYLONITRILE MATERIAL

Raymond G. Spain, Huntington Beach, and James E. Massie, Westminster, both of Calif., assignors to Hitco, Newport Beach, Calif.

Division of Ser. No. 510,673, Jul. 5, 1983, Pat. No. 4,499,216.
This application Nov. 13, 1984, Ser. No. 670,564
Int. Cl.[4] B65H *69/02*
U.S. Cl. 156—158 **6 Claims**



1. A method of splicing together two different lengths of carbonized polyacrylonitrile material comprising the steps of:
coating the ends of the two different lengths of carbonized polyacrylonitrile material with a resin solution comprising a solid acrylic polymer, a liquid acrylic polymer of substantially lower molecular weight than said solid acrylic polymer, an epoxy resin, and a solvent;
joining the coated ends of the two different lengths of carbonized polyacrylonitrile material together;
heating the joined together coated ends of the two different lengths of carbonized polyacrylonitrile material to cure the resin solution to form a splice; and
pinching the splice to compact the splice.

4,600,458

METHOD OF MAKING AN ABSORBENT LAMINATE STRUCTURE

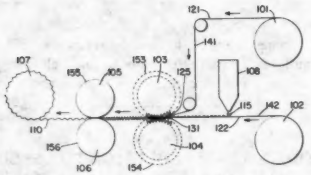
Timothy A. Kramer, Cincinnati; Gerald A. Young, Springfield Township, Clark County, and Ronald W. Kock, Wyoming, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Division of Ser. No. 563,339, Dec. 20, 1983, Pat. No. 4,578,068.
This application Jul. 2, 1985, Ser. No. 751,163
Int. Cl.[4] B32B *31/06, 31/08*
U.S. Cl. 156—199 **22 Claims**

1. A process for making a layered absorbent structure, said absorbent structure comprising the following components:
(1) n substantially planar webs of fibrous materials, each of said webs having two substantially parallel surfaces, n being an integer of two or more; and

(2) absorbent particles; said process comprising the following steps:

(a) layering said webs in substantially planar contact such that there is an uppermost web, a lowermost web, n-2 intermediate webs, and n-1 interfaces of two opposed adjacent contacting surfaces of adjacent webs, each of said interfaces having a surface area, whereby a layered stack of webs is formed;



(b) spreading said particles such that said particles form a discontinuous layer at one or more of said interfaces; and

(c) crimping said layered stack of webs with said particles at said interface(s) between two crimping surfaces having mating z-direction geometrical protrusions and concavities.

4,600,459

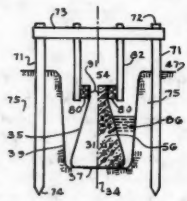
PROCESS FOR CONSTRUCTING COMPACT LONGITUDINAL CONCRETE

Edward A. Proctor, 3417 Clarendon Rd., Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 360,346, Mar. 22, 1982, abandoned. This application Aug. 26, 1985, Ser. No. 769,447

Int. Cl.[4] B28B *1/14, 7/06*

U.S. Cl. 156—212 **15 Claims**



1. A process for constructing a compact longitudinal first concrete member, the process using four consecutive steps of providing and using a partially suspended horizontal hybrid sling with an under loop bearing support, the hybrid sling acting as a mold confining fluid concrete, the hybrid sling having an open throat at its upper end attached to an open rim frame, the sling loop having a long central body portion between two end closures, the central body portion with its two attached end closures making a closed ended trough-like mold container used in constructing the first concrete member, the first step consists in providing a pliable sheet, the sheet being used in making the central body portion, the second step consists in providing rim support equipment for partially suspending the hybrid sling, the support equipment requiring a long narrow rectangular horizontal open rim frame, having two spaced apart parallel side rails terminating at short end cross rails while the rim frame is supported at a predetermined height above said under loop bearing support, by rim frame support equipment resting upon an equipment base, the support equipment consisting of a plurality of inverted "U" shaped supports spaced apart one from another along a common alignment centerline, each "U" support having two uprights spaced apart one from another at equal distances transverse to said alignment centerline, the uprights having upper ends interconnected by a cross-tie beam while having lower ends resting on said equipment base, the third step comprises assembling and attaching an end closure to each end of the sling portion, to create a closed end trough-like compartment having an upper rectangular pliable rim edge, the third step further consists in placing the trough-like compartment beneath the rim frame and attaching the rectangular pliable rim edge to the frame, while the hybrid sling central body portion hangs downward such that the bottom of its loop rests upon the under loop bearing support and where at the bottom of the loop is spread out evenly without wrinkles and creases, the fourth step consists of ingressing a first pour of fluid concrete through the open rim frame into the undistended closed ended hybrid sling whereby the thus confined fluid concrete provides fluid pressures distending the hybrid sling to produce uniform cross-sectional configurations along the length of the now distended hybrid sling, the fluid concrete upon gaining a set produces a long compact concrete member having the same cross-sectional configurations along its length.

4,600,460

PROCESS FOR FABRICATING DISPLAY PANEL

Hisao Taki, and Takeo Iida, both of Tokyo, Japan, assignors to N K B Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 331,814, Dec. 17, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,765

Claims priority, application Japan, Dec. 19, 1980, 55-178994

Int. Cl.[4] B32B *31/00;* **B44C** *1/16;* **B41C** *1/06;* **B41M** *1/14*

U.S. Cl. 156—235 **10 Claims**

1. A process for fabricating a transparent multicolored display panel comprising the steps of:

(a) printing a multicolor transparent image-pattern over one surface of a sheet of pulp paper by means of a multicolor printing press;

(b) printing said multicolor image pattern over the thus-printed surface for a sufficient number of times so as to build up a multiple stack of printed ink layers such that each color layer exactly overlays and is precisely aligned with the preceding layers so that each colored segment layer is the same in dimensions and color characteristics as the preceding layer to intensify each of the individual colors in the multiform image-pattern;

(c) bonding the multicolor image-pattern bearing surface of said sheet of pulp paper to one surface of a transparent panel base; and,

(d) removing the said sheet of pulp paper so that the said image pattern is imposed on one surface of said transparent panel base.

4,600,461

METHOD OF EXTRUDING A FOAMED THERMOPLASTIC CORE AND EXTRUDING AND INTEGRALLY SEALING A NON-POROUS SKIN THEREON

Robert R. Guy, North Royalton, Ohio, assignor to Lof Plastics Inc., Troy, Mich.

Filed Sep. 12, 1983, Ser. No. 531,415

Int. Cl.[4] B29C *47/30, 63/02, 65/00*

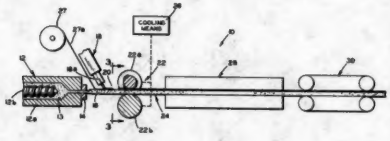
U.S. Cl. 156—244.12 **6 Claims**

1. A process for producing an extruded plastic material product having a predetermined cross-sectional shape, said process comprising the steps of:

(a) extruding a foamable thermoplastic material through a first die outlet;

(b) permitting the foamable thermoplastic material having exited the first die outlet to expand and form a cellular core of foamed thermoplastic material;

(c) subsequent to step (b), and prior to any shaping or forming of the cellular core, applying a film of substantially non-porous thermoplastic material along at least one side of the cellular core by extruding the non-porous thermo-



plastic material through a second die outlet spaced from the first die outlet and positioned to apply the extruded non-porous thermoplastic material directly to the cellular core; and

(d) simultaneously shaping and integrally sealing the cellular core having the film thereon into a unitary product having said predetermined cross-sectional shape by causing the cellular core having the film thereon to pass through a forming die to shape at least one side thereof into a predetermined configuration.

4,600,462

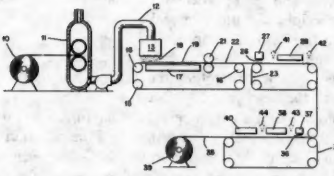
INCORPORATION OF A HYDROPHILE IN FIBROUS WEBS TO ENHANCE ABSORBENCY

William R. Watt, Princeton Junction, N.J., assignor to James River/Dixie-Northern, Inc., Norwalk, Conn.

Continuation of Ser. No. 482,794, Apr. 7, 1983, abandoned, which is a division of Ser. No. 306,718, Sep. 29, 1981, abandoned. This application Apr. 18, 1985, Ser. No. 724,058

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—278 **14 Claims**



1. A process for making an air laid soft. high bulk, absorbent fibrous web having a basis weight in the range between about 8 to about 50 lbs./ream, consisting essentially of the steps of: (a) air laying a loose web; (b) bonding said web with a substantially hydrophobic adhesive material; (c) curing said adhesive material; (d) incorporating into said web an aqueous solution of a water soluble hydrophile at any stage in said process contemporary with or subsequent to said step (b) to enhance the absorbency rate of the web by neutralizing the anti-wetting effects of the substantially hydrophobic adhesive material; and (e) drying said web while retaining between about 0.1 to about 5.0% by weight of said hydrophile, wherein said water soluble hydrophile is selected from the group consisting of polyethylene oxide, cellulose ethers, hydroxymethyl cellulose, polyvinyl alcohol, polyvinyl pyrrolidone, gelatin, graft copolymers of starch, crosslinked polyacrylates, acrylate polymers, crosslinked carboxymethyl cellulose alkali salts, starch or guar gum grafted with acrylamide acid salts in combination with divinyl compounds, glycerin, and compatible combinations thereof.

4,600,463

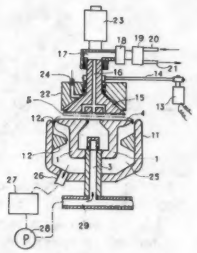
TREATMENT BASIN FOR SEMICONDUCTOR MATERIAL

Selichiro Aigo, 3-15-13 Negishi, Daito-ku, Tokyo, Japan

Filed Jan. 4, 1985, Ser. No. 688,886

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; H01L *21/306*

U.S. Cl. 156—345 **4 Claims**



1. In a basin for applying a treatment such as development, etching or plating to one of the surfaces of a semiconductor material, which is supported spacedly above a top portion of the basin with one surface facing downwardly, by introducing a treatment liquid through a passage formed in a lower part of the basin and then blowing the treatment liquid upwardly against the one surface of the semiconductor material, the improvement comprising the basin having a top portion, the inner surface of which frustoconically tapers upwardly and inwardly to a centrally defined hole permitting passage of the treatment liquid therethrough and the outer surface of which defines a table surface wider than the area of the one surface of the semiconductor material.

4,600,464

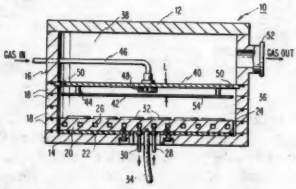
PLASMA ETCHING REACTOR WITH REDUCED PLASMA POTENTIAL

Brian H. Desilets, Wappingers Falls; Thomas A. Gunther, Hopewell Junction; Charles J. Hendricks, Wappingers Falls, and John H. Keller, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1985, Ser. No. 729,445

Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; C23F *1/02*

U.S. Cl. 156—345 **11 Claims**



1. In a plasma reactor having a planar cathode and a plasma chamber acting as an anode, wherein an RF signal applied between said cathode and said anode acts to produce a plasma therebetween, the improvement comprising:

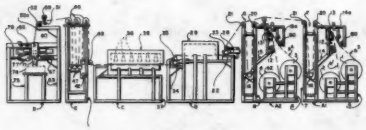
a grounded plate spaced apart from the upper surface of said chamber a predetermined distance, said distance being large enough to allow a plasma to be established between said upper chamber surface and said grounded plate, but not so large as to disturb the field in the proximity of said cathode.

4,600,465

DEVICE FOR HANDLING ELONGATED WEBS

Robert G. Delannoy, Paris, France, assignor to Molinier S. A., France

Filed Feb. 7, 1984, Ser. No. 577,710
Claims priority, application France, Feb. 8, 1983, 83 02278
Int. Cl.[4] B32B *31/08, 31/18, 31/26*
U.S. Cl. 156—351 20 Claims



1. A machine for treating surgical bands after manufacture comprising a succession of stations (A1, A2, B, C, E, D,) along which bands (b1, b2, b3, b4) stored on skeins, (1,2,3,4) are unwound under steady tensioning by powder electromagnetic coupling devices, and associated drive motors (11) for the skeins which are connected in a continuous manner to the changes of said skeins by bonding devices having double face adhesive means disposed between said skeins, magazines (F, G) for discharging the bands to a retraction device under reduced tensioning and by steaming enclosure means (29) or directly to a drying or retraction enclosure (36), whereby the dried bands are passed through a band varying reserve (E) by alternate windings prior to being wound in pre-determined lengths and in a continuous manner in a winding station (D), and means for checking the quality and checking and adjustment of the wound lengths; the retraction means, winding means and drying means of the machine being operated in synchronism under the control means of a programmable automatic device, based upon the weight of band lengths wound.

4,600,466

HAND ROLLER FOR THE APPLICATION OF METAL FOILS TO THE EDGES OF FLAT GLASS ARTICLES

Heinz Herrmann, Leipziger Str. 105, 4154 Tönisvorst, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,531
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 8332604[U]
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—391 17 Claims

1. A hand roller for applying an adhesive-backed metal foil to the edge of a flat glass article which comprises:

an elongated handle provided with a guide for said foil;

a blade at one end of said guide for peeling a masking strip away from its adhesive surface of said foil; and

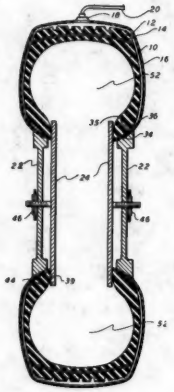
pressing means at an opposite end of said guide for pressing said foil against said edge so that an adhesive surface of said foil is adhered to said article, said guide being a planar guide path at least partly recessed in said handle whereby flanks of said handle define said guide path and said handle being formed with at least a portion overhanging said guide path, said blade being formed unitarily on said handle, said pressing means includes a pin having a rounded cross section spanning between the flanks defining said guide path and fixed with respect to said handle, said pin being disposed above a planar guide surface of said path.

4,600,467

APPARATUS AND METHOD FOR TIRE RECAPPING

Thad A. Perdue, Muscle Shoals, Ala., assignor to Robbins Tire and Rubber Company, Inc., Tuscumbia, Ala.

Filed Sep. 13, 1984, Ser. No. 650,340
Int. Cl.[4] B29H *30/54*
U.S. Cl. 156—394.1 5 Claims



1. In combination with a tire casing, including a pre-formed, precured, or uncured tread disposed about its periphery, and a curing envelope covering said tread and at least the outwardly facing side walls and bead portion of the said tire casing; means for effecting a tight and uniform seal between the said curing envelope and tire casing, comprising:

a pair of annular sealing members, each having a central hub and a peripheral circumferential surface adapted to engage with the bead portion of said tire casing;

a pair of unitary backing members, each having a central hub and portions at equal radial distances from the said hub which are engagable with the inwardly facing peripheral edge of said tire casing; a pair of said annular and backing members being provided at each side of said tire; the said pairs being mechanically independent of each other;

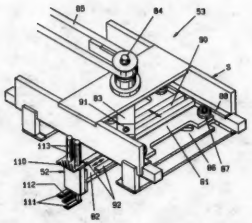
threaded fastener means extending between the hubs of each said annular member and said paired backing member to enable said annular and backing members to be drawn toward one another to effect a clamping action between said members and the intervening envelope and tire bead as said members are drawn together; the portion of said annular member contacting said tire bead being formed as to be contoured smoothly inwardly to have a reduced radius at the side thereof facing the interior of the tire, as to define a cam surface facing the cooperating surface of said bead, whereby drawing the said members toward each other effects a continuously tighter seal as the two members approach one another; and

both the sealing members and backing members having openings in their plane, and the space between said backing members being free of obstructions, to thereby allow heat and gas flow to the interior of said tire casing during curing.

4,600,468
MACHINE FOR EFFICIENT ASSEMBLY OF BIASED YARN ARRAYS

Robert G. Kelly, Latham, and Walter G. Spang, Saratoga Springs, both of N.Y., assignors to Norton Company, Worcester, Mass.

Filed Nov. 19, 1984, Ser. No. 672,987
Int. Cl.[4] D04H *3/05*; B32B *5/12*
U.S. Cl. 156—440 **8 Claims**



1. A machine for assembling spaced biased yarn arrays, comprising:

(a) a machine frame which supports all the other components;

(b) two endless yarn carrier strips disposed on said machine frame and movable generally parallel to each other, each of said carrier strips bearing along its length on the side facing the other carrier strip a plurality of spaced yarn restrainers capable of holding individual yarns in position;

(c) yarn laying means mounted on said machine frame, having an input section, and adapted for (i) holding in a substantially straight line array in a single plane a plurality of yarns continuously supplied under light tension to said input section, (ii) extending said plurality of yarns in substantially parallel orientation while conveying said plurality of yarns in one direction accross the space between said carrier strips of part (a) along a first path making an angle of from ten to eighty degrees with said carrier strips and in the reverse direction across the space between said yarn carrier strips along a second path making an angle between 0.5° and 5° with said first path, and (iii) causing each of said plurality of yarns to be restrained by at least one of said yarn restrainers on each of said two yarn carrier strips during each complete cycle of movement of said yarn laying means from a starting position midway between the two yarn carrier strips toward one of the two yarn carrier strips, back to the other yarn carrier strip, and finally back to the starting position;

(d) means for continuously supplying continuous yarns under constant light tension to the input section of said yarn laying means;

(e) actuating means for causing said yarn laying means to move back and forth across the space between said yarn carrier strips and simultaneously advancing said yarn carrier strips at such a speed as to leave, within a continuous zone extending between said yarn carrier strips and along the direction of advancement of the said yarn carrier strips, a regularly spaced array of yarns which is moved forward along with the yarn carrier strips and their associated yarn restrainers,

(f) means for encapsulating said regularly spaced array of yarns within adhesive while said array is held in the regularly spaced position in which it was laid down;

(g) means for processing said adhesive of part (f) so as to give it sufficient coherence to hold the central portion of said regularly spaced array of yarns together as part of a continuous web; and

(h) means for compressing said continuous web so that the volume of yarn in the web is at least as great as the volume of adhesive,

wherein said means for encapsulating said regularly spaced array of yarns within adhesive comprise means for supplying a continuous web of softenable dry film adhesive to each side of the array of regularly spaced yarns; wherein said means for processing adhesive so as to give it sufficient coherence to hole the central portion of said regularly spaced array of yarns together as part of a continuous web operate simultaneously with said means for compressing said continuous web so that the volume of yarn in the web is at least as great as the volume of adhesive, so as to encapsulate said regularly spaced yarn array within adhesive derived from said dry films; said machine further comprising:

(i) means for detaching said continuous web, formed by encapsulating with adhesive, from said yarn restrainers, and

(j) means for continuously removing any portion of said continuous web which consists of yarn not encapsulated with adhesive and for slitting the remainder of such web into convenient widths for use in joining coated abrasive belts,

wherein said yarn laying means comprise:

(k) a first sliding carriage capable of reciprocal motion along a first straight line direction with respect to the machine frame, said first sliding carriage having on one of its major surfaces a walled slot with its central axis oriented at a substantial angle to the direction of reciprocal motion and having on its other major surface structures defining a sliding track in which a suitably prepared component can slide reciprocally along a second straight line direction, said second straight line direction being disposed at a substantial angle to said first straight line direction;

(l) a second sliding carriage provided with structures which allow it to slide smoothly within the sliding track on said first sliding carriage, said second sliding carriage having on one end thereof means for conveying a small yarn array, said second sliding carriage also having on one surface thereof a cam follower projection;

(m) a guide plate fixed to the machine frame, said guide plate having therein a slot cam into which fits said cam follower projection from said second sliding carriage, said cam slot having camming surfaces in a shape which will constrain said means for carrying a small yarn array to follow, within a central zone centered between said carrier strips and having a width at least half the total distance between said carrier strips, a substantially linear path between said carrier strips at an angle thereto of between ten and eight degrees;

(n) a guide bar fitting within said walled slot on said first sliding carriage; and

(o) means for causing said guide bar, when actuated, to rotate in a circle, thereby causing said first sliding carriage to execute reciprocal linear motion relative to said guide plate,

whereby said cam slot controls the motion of said cam follower and attached second sliding carriage, all of said components having dimensions and orientations such that said means for conveying a small yarn array moves in a sufficiently wide path to carry said small yarn array into a position where the yarns of said small array can be restrained by the yarn restrainers on both yarn carrier strips during each complete cycle of motion of said means for conveying a small yarn array.

4,600,469
METHOD FOR POLISHING DETECTOR MATERIAL

Albert J. Fusco, East Boston, and Bruce C. Cochran, Lexington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

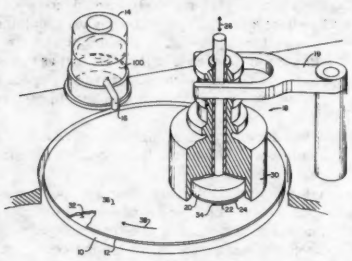
Filed Dec. 21, 1984, Ser. No. 684,894
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/00*
U.S. Cl. 156—636 **16 Claims**

1. A method for the chemical-mechanical polishing of the surface of detector material to a high degree of planarity and surface quality, said method comprising the steps of:

A. maintaining said material surface continuously wet with

an excess quantity of an aqueous solution comprising potassium-iodine iodide in deionized water; and

B. continuously wiping said material surface with a firm



surface, using moderate pressure, while maintaining a relative movement between said material surface and said firm surface in order to remove material from the high points of said material surface.

4,600,470

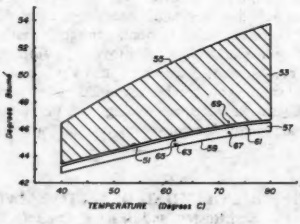
METHOD FOR ETCHING SMALL-RATIO APERTURES INTO A STRIP OF CARBON STEEL

Richard B. Maynard, Colerain Township, Lancaster County; John J. Moscony, Manheim Township, Lancaster County, and Margaret H. Saunders, East Lampeter Township, Lancaster County, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 16, 1985, Ser. No. 723,654

Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—644 **9 Claims**



1. A method for etching an array of apertures through a carbon-steel sheet wherein, for each of the majority of said apertures, the ratio of the desired smallest cross-sectional dimension thereof to the thickness of said sheet is less than about 0.9, said sheet having etch-resistant stencils on opposite major surfaces thereof, said method comprising contacting said stencilled major surfaces with ferric chloride etchant having a specific gravity in a range at which a smooth finish is realized.

4,600,471

METHOD AND APPARATUS FOR TRANSPORT AND PROCESSING OF SUBSTRATE WITH DEVELOPING AGENT

Edward Bok, Badhoevedorp, Netherlands, assignor to Integrated Automation, Limited, Road Town, British Virgin Isls.

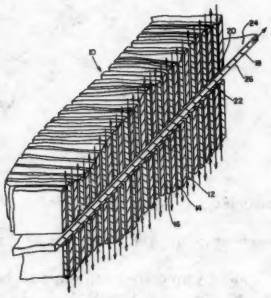
Division of Ser. No. 491,318, Apr. 25, 1983, Pat. No. 4,495,024.

This application Jan. 18, 1985, Ser. No. 692,737

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] B29C *17/08*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—646 **20 Claims**



1. Method of transporting and processing a substrate with developing agent within a confined passage, comprising:

a. sequentially supplying and discharging fluid medium on both sides of the substrate via sequentially located fluid medium supply and fluid medium discharge channels intersecting the top and bottom of said passage, such that the moving fluid medium cushions the substrate; and

b. pressurizing said fluid medium, such that both sides of the substrates remain free of contact with the passage and applying developing agent, via a developing agent supply channel intersecting the passage upon at least one side of the substrate.

4,600,472

APPARATUS FOR COOKING OR GELATINIZING MATERIALS

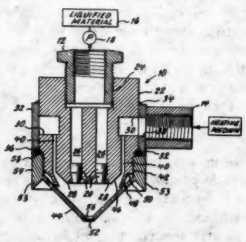
Esra Pitchon, Flushing, N.Y.; Joseph D. O'Rourke, Dover, and Theodore H. Joseph, Ellendale, both of Del., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 103,779, Dec. 14, 1979, Pat. No. 4,280,851.

This application Mar. 20, 1981, Ser. No. 245,836

Int. Cl.[4] B01D *1/16*

U.S. Cl. 159—4.4 **1 Claim**



1. An apparatus for uniformly cooking a liquified material comprising:

(a) a nozzle means for atomizing a liquified material;

(b) a means for pumping said liquified material through said

nozzle and through a first atomization aperture located within said nozzle;

(c) a plurality of second apertures surrounding said atomization aperture, said second apertures being means for interjecting a heating medium into the atomized material in order to cook said material;

(d) an enclosed chamber means surrounding said first atomization aperture and said second apertures and in which the heating medium is interjected into the atomized material, said chamber containing a vent aperture means positioned to enable the atomized material to exit the chamber, the size and shape of the chamber means and vent aperture means being effective to maintain a temperature of at least 298° F. and a pressure above 50 p.s.i.g. for a period of time sufficient to cook said material; and,

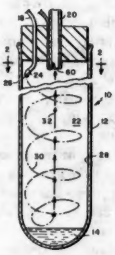
(e) an annular lip on the outer circumference of the nozzle to help prevent the vent aperture means from becoming clogged.

4,600,473

CONTROL OF LABORATORY EVAPORATION

David R. Friswell, Holliston, Mass., assignor to Zymark Corporation, Hopkinton, Mass.

Filed Nov. 9, 1984, Ser. No. 669,960
Int. Cl.⁴ B01D 1/14
U.S. Cl. 159—47.1 **10 Claims**



1. In a process for recovering solids from liquids by evaporating said liquid until said solids have been converted to a solid composition of a desired state of dryness, said process comprising the steps of:

(a) placing a liquid composition containing said solids and said liquid in a tubular receptacle;

(b) causing drying gas to flow into said receptacle through an inlet to said tubular receptacle which inlet directs the flow of said drying gas preferentially along the wall of said receptacle and into intimate contact with said solution as the liquid is being removed from said solution;

(c) then removing said drying gas through another conduit in said inlet of said tubular receptacle while avoiding dilution of said gas by said incoming gas so as to maintain a significant temperature difference between incoming drying gas and outgoing gas during said evaporating process;

(d) sensing a change in rate of evaporation by thermally monitoring the temperature of said evaporation process; and

(e) decreasing the flow of drying gas in response to said sensed change in rate of evaporation, thereby obtaining said solid in said desired state.

6. Apparatus for isolating solids from liquids by evaporating said liquid, said apparatus comprising:

(a) a tubular vessel having a closure only at the top thereof and forming means to hold a liquid composition position to be dried to a suitably dry state near the bottom thereof;

(b) a first supply conduit through said closure and positioned near the top of said vessel forming means for conveying drying gas into said tube through said opening, and into contact with said composition being dried;

(c) a second conduit located in said closure and forming means to remove said drying gas after it has contacted said composition being dried;

(d) each said conduit means accessing said tube at said tubular opening and said conduits together forming a means to avoid excessive dilution of incoming gas by gas being removed from said vessel;

(e) a control circuit forming means to sense a temperature condition of said evaporating; and

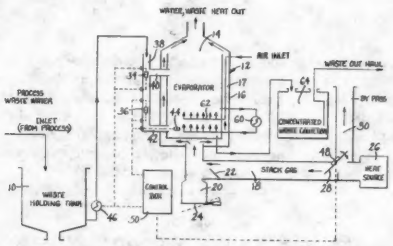
(f) circuit means to reduce or stop the flow of said drying gas in response to said temperature condition.

4,600,474

EVAPORATION METHOD

Theodore F. Korenowski, Branford, Conn., assignor to TFK Company, Inc., Branford, Conn.

Filed Jul. 22, 1985, Ser. No. 757,530
Int. Cl.⁴ B01D 1/00; F26B 7/00
U.S. Cl. 159—47.3 **13 Claims**



1. A method for using the waste heat energy of a gas stream to heat a liquid so as to cause the evaporation of a volatile agent therefrom, said method comprising:

a. inserting into the gas stream, container means comprising

(1) an inner chamber to hold the liquid,

(2) an outer chamber forming a gas channel substantially surrounding said inner chamber through the gas stream flows, and

(3) sump means to receive and store any liquid condensing from the gas stream and any liquid leaking from said inner chamber, so as to prevent the liquid from flowing back to the source of the gas stream;

b. feeding a sufficient quantity of the liquid into said inner chamber; and

c. venting the evaporated volatile agent from said inner chamber so that it combines with said gas stream for discharge.

4,600,475

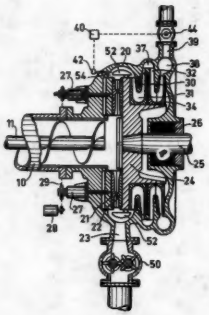
REFINING APPARATUS WITH RADIAL PASSAGEWAYS FOR STEAM RECOVERY

Rolf B. Reinhall, and Johan G. I. Johansson, both of Bellevue, Wash., assignors to Sunds Defibrator Aktiebolag, Sundsvall, Sweden

PCT No. PCT/SE84/00057, § 371 Date Nov. 7, 1984, § 102(e) Date Nov. 7, 1984, PCT Pub. No. WO84/03526, PCT Pub. Date Sep. 13, 1984
PCT Filed Feb. 17, 1984, Ser. No. 679,044
Claims priority, application Sweden, Mar. 9, 1983, 8301271
Int. Cl.⁴ D21C 1/12; D21D 1/30
U.S. Cl. 162—261 **7 Claims**

1. An apparatus for entirely or partially recovering steam which is generated in a process for manufacturing fiber pulp from lignocellulose-containing material, comprising at least two opposed refining members rotatable relative to each other

about an axis and enclosed in a pressure-proof refiner housing, the refining members between themselves form at least one gap in which the lignocellulose-containing material is intended to be disintegrated to fiber pulp, wherein a rotor is axially spaced from the refining members and rotatable with one of the refining members, wing members being provided on the rotor and rotatable together with said one of the refining members, a first



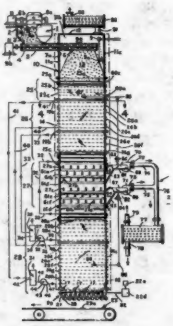
space provided in the housing and located radially outwardly from the refining members, the wing members defining passageways between each other which extend in a first direction substantially radially inward and thereafter in a second direction substantially radially outward to an annular space in communication with an outlet for the steam, said passageways connect the first space to said annular space.

4,600,476

APPARATUS FOR ABOVEGROUND SEPARATION, VAPORIZATION AND RECOVERY OF OIL FROM OIL SHALE

Ray C. Edwards, Kinnelon, N.J., assignor to Edwards Engineering Corporation, Pompton Plains, N.J.

Continuation-in-part of Ser. No. 457,975, Jan. 14, 1983, Pat. No. 4,502,920. This application Feb. 28, 1985, Ser. No. 706,473
The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.
Int. Cl.[4] C10B *1/04*
U.S. Cl. 202—84 **41 Claims**



1. A retort apparatus for recovering hydrocarbons from oil shale comprising:

a. an elongated housing, having passage means end to end therethrough, inlet means to permit delivery of crushed shale into one end of the housing for movement along said passage means, and outlet means in communication with the end of the passage means remote from the inlet means for removing the spent oil shale from the passage means, said passage means disposed serially between the inlet means and the outlet means to define in the passage means a drying zone, a preheat zone, a cracking and distillation zone, and a waste heat recovery zone,

b. a plurality of heat exchange means connected in said housing for heat exchange with the crushed oil shale moving through said passage means,

c. circulating means connecting the respective one of said plurality of heat exchange means in the preheat zone with the respective one of said plurality of heat exchange means in the waste heat recovery zone for passing waste heat from said waste heat recovery zone to said preheat zone,

d. auxiliary heating means connected to the one of said plurality of heat exchange means in said cracking and distillation zone to raise the temperature of the crushed oil shale moving therethrough to the critical temperature for separating hydrocarbon vapors from said crushed oil shale,

e. said heat exchange means in the cracking and distillation zone including a plurality of parallel heat exchange tubes, each heat exchange tube having an elongated cross-sectional configuration, said heat exchange tubes being arranged in vertical rows, the heat exchange tubes in each row being staggered with respect to heat exchange tubes of adjacent vertical rows, each heat exchange tube, in cross-section, having an associated surrounding area not related with any other heat exchange tube, and the area of each heat exchange tube, in cross-section, defined by the external dimensions thereof, constituting approximately one-third of the associated surrounding area,

f. separating means connected in said housing for communication with said cracking and distillation zone to withdraw and condense the hydrocarbon vapors released from the crushed oil shale moving through the passage means and to recover the same,

g. means connected to the housing to control movement of crushed oil shale through said passage means,

h. means for sensing the pressures in said passage means on opposite sides of said cracking and distillation zone,

i. means for adjusting the pressure in said cracking and distillation zone in response to the sensed pressures and to a pressure greater than the pressures in the other zones, and

j. means adjacent the outlet means for removing spent oil shale discharged therefrom.

4,600,477

METHOD OF PROCESSING FERMENTED LIQUID

Takehiro Higashi; Michio Kobori; Zenichi Yoshino, and Seiichi Morimoto, all of Kashihara, Japan, assignors to Sanwa Shoji Co., Ltd., Japan

Continuation of Ser. No. 545,183, Oct. 25, 1983, abandoned. This application Oct. 25, 1985, Ser. No. 790,810
Claims priority, application Japan, Oct. 29, 1982, 57-191437
Int. Cl.[4] B01D *1/28;* C12P *7/06*
U.S. Cl. 203—26 **3 Claims**

1. A method of processing a fermented liquid containing alcohol comprising:

(a) feeding said fermented liquid into a vacuum vaporizer,

(b) heating the feed in said vaporizer to separate it into a vapor and a concentrated liquid fraction, said concentrated liquid fraction being discharged to the outside and recovered as a product as a livestock feed or an antibiotic substance,

(c) compressing the vapor,

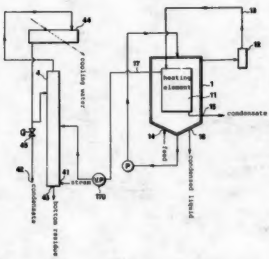
(d) passing the compressed vapor in indirect heat exchange with the fermented liquor as the source of heat to produce additional vapor in the vacuum vaporizer thereby condensing compressed vapor,

(e) discharging the condensed vapor to the outside as a distillate, the COD of which is so low that the application thereof to an activated sludge treatment as a post-treat-

ment is remarkably easy thereby minimizing energy consumption,

(f) supplying a portion of the remaining compressed vapor to a multistage distilling column,

(g) separating said portion of the compressed vapor into two fractions, one with a higher boiling point than the other, within said distilling column,



(h) condensing said fraction with the lower boiling point to yield an alcohol-rich distillate, and

(i) discharging the other fraction with the higher boiling point to the outside as a bottom residue, the COD of which is so low that the application thereof to an activated sludge treatment as a post-treatment is remarkably easy thereby minimizing energy consumption.

4,600,478

ELECTROSYNTHESIS OF SIX-MEMBERED HETEROCYCLIC ALCOHOLS

Kenneth J. Stutts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 28, 1985, Ser. No. 749,709

Int. Cl.⁴ C25C *1/00*

U.S. Cl. 204—59 R **30 Claims**

1. A process for producing a six-membered heterocyclic alcohol comprising subjecting an organic diol, in contact with an electrolyte, to electrical potential sufficient to product the six-membered heterocyclic alcohol, wherein the organic diol is represented by the formula:

$$HOCH_2RCH_2OH$$

wherein R is a divalent organic moiety having a three-membered chain bonded at each end to one of the $—CH_2OH$ moieties.

4,600,479

METHOD FOR PROTECTING PAIRED METAL FORCE-TRANSMITTING MACHINE ELEMENTS AGAINST FRETTING CORROSION

Martin Thoma, and Paul Bünger, both of Munich, Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,298

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236376

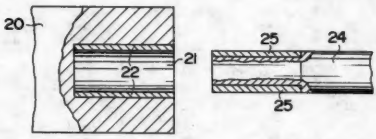
Int. Cl.⁴ C25D *3/38*

U.S. Cl. 204—14.1 **6 Claims**

1. A method of protecting metal machine elements for being paired in a force transmitting force-locking manner and for being subjected to oscillating load conditions, against fretting corrosion, comprising the following steps:

(a) providing metal machine elements each having a pairing surface made of a composition comprising titanium and having a given crystal structure and a given hardness, said pairing surfaces being provided for forming a pair of machine elements cooperating with each other in said force transmitting, force-locking manner,

(b) galvanically depositing on at least one of said two pairing surfaces of the machine elements a protection layer made of a metal having a crystal structure which differs from the crystal structure of the composition comprising titanium, said metal of said protection layer having a smaller hardness than said given hardness of said composition comprising titanium, for preventing a direct contact between the machine elements when they are pairing, and



(c) continuing said galvanically depositing step until said protection layer has a thickness within the range of about 5 to about 50 micrometer.

4,600,480

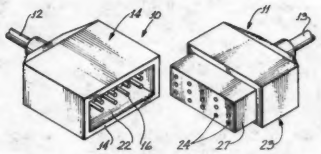
METHOD FOR SELECTIVELY PLATING PLASTICS

Robert L. Coombes, La Canada Flintridge, and Kay Huesken, Monrovia, both of Calif., assignors to Crown City Plating, El Monte, Calif.

Filed May 9, 1985, Ser. No. 732,100

Int. Cl.⁴ C25D *5/54*

U.S. Cl. 204—20 **19 Claims**



1. A method for selectively plating a platable non-conductive plastic substrate to provide a conductive coating over first selected surfaces of the substrate and no conductive coating over second selected surfaces of the substrate comprising:

plating the substrate in an electroless plating process wherein a first metal is deposited over substantially all of the first selected surfaces and at least a portion of the second selected surfaces;

mounting the electrolessly plated substrate on an electroplating rack so that the current density at the second selected surfaces is lower during subsequent electroplating than at the first selected surfaces;

electroplating the electrolessly plated substrate with a second metal different from the first metal under conditions where the second metal deposits over the first selected surfaces but not over the second selected surfaces; and

immersing the electroplated substrate in a stripping solution capable of dissolving the first metal but not the second metal for a time sufficient to dissolve substantially all of the first metal deposited over the second selected surfaces.

4,600,481

ALUMINUM PRODUCTION CELL COMPONENTS

Ajit Y. Sane, Willoughby; Douglas J. Wheeler, Cleveland Heights, both of Ohio; Dan Gagescu, Petit-Lancy, Switzerland; Pierre E. Debely, Geneva, Switzerland; Iudita L. Adorian, Geneva, Switzerland, and Jean-Pierre Derivaz, Geneva, Switzerland, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Filed Dec. 30, 1982, Ser. No. 454,719

Int. Cl.[4] C25C *3/06;* B29C *71/00;* B05D *1/18*

U.S. Cl. 204—67 12 Claims

1. In a process of operating an electrolytic aluminum-production cell at temperatures in the vicinity of 1000° C. wherein a mass of molten aluminum within said cell functions as a part of the main current carrying circuit, the improvement which comprises employing as at least one of the cell components in contact with said molten aluminum a body comprised of a preformed self-sustaining refractory matrix having a rigid porous structure with open ordered or random intercommunicating voids extending throughout and composed predominantly of material from the group consisting of alumina, aluminum nitride, aluminum oxynitride, SiAlON, boron nitride, silicon carbide, silicon nitride, aluminum boride, and carbides, carbonitrides, boronitrides and borocarbides of Group IVb, Vb, and VIb metals, said voids having been filled or substantially filled with aluminum by intimately contacting said preformed matrix with molten aluminum under an inert atmosphere while maintaining temperatures of at least 1000° C. in the presence of an effective wetting agent for the interior surfaces of said voids of at least one diboride of titanium, zirconium, hafnium or niobium, for several hours, thereby assuring thorough wetting of the matrix surfaces within said voids by the molten aluminum, said matrix incorporating at least at the surface of its voids at least one diboride of titanium, zirconium, hafnium or niobium.

4,600,482

PROCESS FOR THE ELECTROCHEMICAL ROUGHENING OF ALUMINUM FOR USE AS PRINTING PLATE SUPPORTS, IN AN AQUEOUS MIXED ELECTROLYTE

Dieter Mohr, Schlangenbad, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1985, Ser. No. 726,242

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415338

Int. Cl.[4] C25F *3/04*

U.S. Cl. 204—129.4 15 Claims

1. A process for the electrochemical roughening of a material selected from aluminum and aluminum alloys, comprising the steps of:

placing the material in an aqueous mixed electrolyte solution containing HCl and at least one haloalkanoic acid selected from $Hal_xH_{y-x}C_z$—COOH, wherein Hal denotes a halogen atom, z is an integer from 1 to 5, $y=2z+1$, and x is an integer from 1 to y; and

subjecting the material to the action of alternating current.

4,600,483

ELECTROLYTIC REDUCTION OF COBALTIC AMMINE

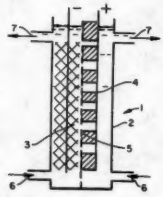
Gale L. Hubred, Richmond, and Michael Dubrovsky, Albany, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 19, 1984, Ser. No. 672,777

Int. Cl.[4] C25F *5/00*

U.S. Cl. 204—130 9 Claims

1. An electrolytic process for the reduction of Co^{III} to Co^{II} in an aqueous ammoniacal solution in an electrolytic cell, comprising an anode compartment, a cathode compartment and a permeable membrane in contact with the anode and located between the anode and cathode compartments and wherein said cathode compartment contains a porous electrode having a porosity in the range of from about 30 to 60 percent comprising introducing the aqueous ammoniacal cobaltic (III) solution into the cathode compartment of the electrolytic cell, providing an aqueous electrolyte in the anode compartment, applying direct current to the anode and cathode to produce cobaltous (II) ions in the cathode compartment while substantially preventing migration of cobaltous anions between the cathode and anode compartments by maintaining



a permeable membrane between the anode and the porous cathode, removing produced gas from the anode compartment and removing the electrolyte containing cobaltous ions from the cathode compartment, wherein the electrolyte in the anode compartment is an aqueous solution of sodium sulfate, and wherein the cathode is treated with an aqueous ammoniacal cobaltic (III) solution for a time sufficient to dissolve any cobalt which may have deposited on said cathode.

4,600,484

HYDROSILATION PROCESS USING A (η^5-CYCLOPENTADIENYL)TRI(σ-ALIPHATIC) PLATINUM COMPLEX AS THE CATALYST

Timothy J. Drahnak, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 558,617, Dec. 6, 1983, Pat. No. 4,510,094. This application Oct. 25, 1984, Ser. No. 664,595

Int. Cl.[4] B01J *19/12*

U.S. Cl. 204—157.74 19 Claims

1. In a hydrosilation process which comprises reacting by heating or exposing to actinic radiation a composition comprising a compound having aliphatic unsaturation and a compound containing at least one silicon-bonded hydrogen atom and not having more than two hydrogen atoms attached to any one silicon atom, in the presence of a platinum hydrosilation catalyst, the improvement which comprises using, as the catalyst, a (η^5-cyclopentadienyl) tri(σ-aliphatic)platinum complex.

4,600,485

AQUEOUS ELECTRODIP LACQUER COATING COMPOUND CAPABLE OF BEING DEPOSITED AT THE CATHODE, AND ITS USE

Hans-Peter Patzschke; Armin Goebel, and Klausjörg Klein, all of Wuppertal, Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschraenkter Haftung, Wuppertal, Fed. Rep. of Germany

Division of Ser. No. 656,356, Oct. 1, 1984. This application Nov. 25, 1985, Ser. No. 802,155

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 3336749

Int. Cl.[4] C09D *5/44;* C25D *13/00*

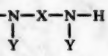
U.S. Cl. 204—181.7 8 Claims

1. A method of coating electrically conductive substrates comprising cathodically depositing an aqueous electrodip lacquer composition onto an electrically conductive substrate wherein said composition comprises a synthetic resin binder of:

(A) 55 to 95% by weight, based on the total quantity of synthetic resin binder, of a synthetic resin binder containing hydroxyl groups and tertiary amino groups and having an average molar weight ($\overline{Mn}$) of 500 to 20,000, a pK_b

value of 3 to 7 and a hydroxyl number of 50 to 400 and an amine number of 30 to 150, which binder can be rendered water soluble by protonation with acid, and

(B) 5 to 45% by weight of a cross-linking agent containing ester groups capable of transesterification or transamidation and having an average molar weight ($\overline{M}n$) of 350 to 5000, an ester number of terminal reactive ester groups of 30 to 500, the ester groups being substantially stable in a neutral aqueous medium but capable of reacting with hydroxyl groups of synthetic resin binder (A) in an alkaline medium at temperatures above 140° C., wherein component (A) contains, in a quantity of at least 8% by weight, calculated as compounds of formula I and based on the total weight of component (A), at least one molecule-enlarging diamine corresponding to the formula:



I

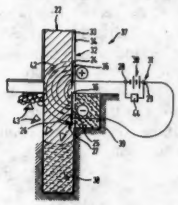
wherein the symbol Y stands for H or C_mH_{2m+1} (m=1 to 8) or an organic group used for defunctionalization, formed by reaction of the primary amino group with monoepoxides, and the symbol X represents a molecular grouping containing at least one amide or urea group, the grouping X being attached to the nitrogen atoms of formula I through alkylene groups having 1 to 16 carbon atoms.

4,600,486

ELECTRO-OSMOTIC MOVEMENT OF POLAR LIQUID IN A POROUS STRUCTURAL MATERIAL

Hans Oppitz, Mils, Austria, assignor to ELTAC Nogler & Daum KG, Innsbruck, Austria

Filed Oct. 26, 1984, Ser. No. 664,996
Claims priority, application Austria, Aug. 16, 1982, 3101/82
Int. Cl.⁴ B01D *13/02*
U.S. Cl. 204—182.3 **6 Claims**



1. A method for the electro-osmotic movement of polar liquid in a porous structural material in contact with two carrier bodies each constituted by a flexible net having a surface of synthetic resin, the net having conductive filamentary carrier materials incorporated therein, and the nets respectively forming a cathode and an anode, comprising the step of conducting a voltage of a positive and a negative potential between the cathode and anode for alternating time intervals, the time intervals of the positive potential exceeding those of the negative potential.

4,600,487

ELECTRODIALYSIS APPARATUS AND METHOD OF ELECTRODIALYSIS EMPLOYING SAME

Donald A. Dahlgren, 3824 W. Kings Ave., Phoenix, Ariz. 85023

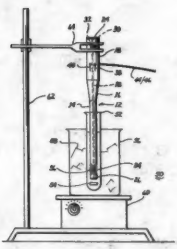
Filed Jul. 2, 1984, Ser. No. 627,205
Int. Cl.⁴ B01D *13/02*
U.S. Cl. 204—182.4 **10 Claims**

1. An electrodialysis method for concentrating electrolytes from a colloidal solution comprising the steps of:

providing a probe having anionic and cationic chambers thereof, said anionic and cationic chambers being separated by an impermeable longitudinal portion in said probe, said anionic and cationic chambers further having a respective negative and positive electrode disposed therein;

subtending an associated aperture to said anionic and cationic chambers of said probe with anionic and cationic semipermeable membranes respectively;

disposing said probe within said colloidal solution; and



applying an electromotive force to said negative and positive electrodes from a means for providing said electromotive force whereby dilution of said electrolytes in said colloidal solution is effectuated with a concurrent concentration of said electrolytes in a solvent contained within said anionic and cationic chambers by electromigratory passage of said electrolytes through said anionic and cationic membranes.

4,600,488

CONTROL METHOD OF MAGNETIC ANISOTROPY AND DEVICE UTILIZING THE CONTROL METHOD

Ryo Imura; Yutaka Sugita, both of Tokorozawa, and Noriyuki Kumasaka, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 691,128
Claims priority, application Japan, Jan. 18, 1984, 59-5585
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—192 N **36 Claims**

1. A control method for controlling a magnetic anisotropy of a magnetic film comprising the steps of:

after formation of a magnetic film having a magnetic anisotropy, applying a magnetic field to the formed magnetic film; and

implanting ions into said formed magnetic film while said magnetic field is being applied thereto;

whereby the magnetic anisotropy is induced along a desired direction in a desired portion of said formed magnetic film.

4,600,489

METHOD AND APPARATUS FOR EVAPORATION ARC STABILIZATION FOR NON-PERMEABLE TARGETS UTILIZING PERMEABLE STOP RING

Anthony R. T. Lefkow, Worthington, Ohio, assignor to VAC-TEC Systems, Inc., Boulder, Colo.

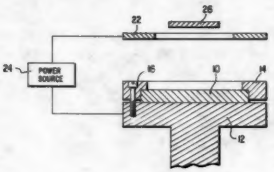
Filed Jan. 19, 1984, Ser. No. 572,007
Int. Cl.⁴ C23C *15/00*
U.S. Cl. 204—192 R **19 Claims**

1. Apparatus for evaporation arc stabilization comprising

a target having a surface of non-permeable material to be evaporated;

means for establishing an arc on the target surface for evaporating the target material, the arc being characterized by the presence of charged particles and a cathode spot which randomly migrates over said target surface; and

a confinement ring surrounding contacting the target surface, the ring being composed of a magnetically permeable material to thereby confine the cathode spot to the target surface.



4,600,490

ANODE FOR MAGNETIC SPUTTERING

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 571,406, Jan. 17, 1984, Pat. No. 4,478,702. This application Oct. 23, 1984, Ser. No. 663,913
Int. Cl.[4] C23C *14/00*
U.S. Cl. 204—298 5 Claims

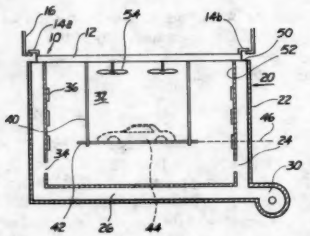
1. In an apparatus for coating a substrate comprising a cathode having a substantially planar surface consisting of a material to be sputtered, magnet means for producing a magnetic field having lines of flux which extend in a curve from said sputtering surface and return thereto to form a magnetic tunnel over a closed loop erosion region on said sputtering surface, an anode positioned to produce an accelerating electric field adjacent said sputtering surface for producing a glow discharge confined by said magnetic field to the region adjacent said sputtering surface and within said magnetic tunnel, and means for connecting said cathode and said anode to a source of electrical potential, the improvement which comprises said anode comprising a metal mesh structure.

4,600,491

WORKPIECE DRYING APPARATUS

Thomas N. Urquhart, 3051 Kingsley Dr., Troy, Mich. 48084, and Gordon T. Urquhart, 19171 Filmore, Southfield, Mich. 48075

Filed May 17, 1984, Ser. No. 611,176
Int. Cl.[4] C25D *13/00*; F26B *3/28*
U.S. Cl. 204—300 EC 16 Claims



1. An apparatus comprising:

a container comprising a bottom and walls extending therefrom forming a volume into which a workpiece to be dried is received, including an opening opposite from said bottom; and

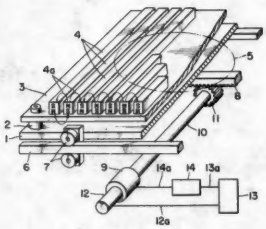
means for enclosing said volume and operative to prevent communication therethrough, the enclosing means including means for supporting and for suspending a workpiece within said volume apart from said walls and said bottom and circulating means, supported by said enclosing means, for circulating heated air within said volume.

4,600,492

MAGNET DRIVING METHOD AND DEVICE FOR SAME

Hirosuke Ooshio; Tetsuo Aikawa; Hidetaka Jo, all of Zama; Haruo Okano, and Takashi Yamazaki, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Tokuda Seisakusho, Zama and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Jul. 24, 1985, Ser. No. 758,505
Claims priority, application Japan, Jul. 25, 1984, 59-154577
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 9 Claims



1. A magnet driving method for moving magnets in a device in which a certain process is performed to a work while generating a plasma due to a magnetron discharge, which method comprises steps of:

(a) disposing the magnets in such a manner that a plurality of magnetic fields having almost the same magnetic field intensity are formed, at an equal interval, in a stripe-pattern form in a vacuum chamber of the device and that the magnetic fields are located in parallel over a region wider than the size of the work to be processed; and

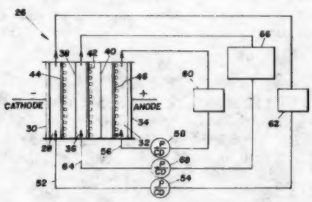
(b) moving reciprocally the magnets in the direction of arrangement of the magnetic fields through a certain stroke while changing gradually the stop points of the magnets over the work in a step-like manner so that the integrated effect of the magnetic field at each position of the surface of the work becomes uniform after a predetermined period of time.

4,600,493

ELECTRODIALYSIS APPARATUS FOR THE CHEMICAL MAINTENANCE OF ELECTROLESS COPPER PLATING BATHS

Emmanuel Korngold, Beersheba, Israel, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 14, 1985, Ser. No. 691,095
Int. Cl.[4] B01D *57/02*
U.S. Cl. 204—301 14 Claims



10. Apparatus for the replenishment of an electroless copper

plating bath that tends to become depleted as the result of the reduction of a water soluble cupric salt in an alkaline solution under copper plating and reducing conditions, said solution when in a depleted condition containing alkali metal salts as reaction products, comprising:

a closed system including a closely packed electrolytic cell having first, second and third compartments which are sealed from the atmosphere and including first and second anion permselective membranes and first and second electrodes, said first permselective membrane forming a chemical barrier between said first and second compartments, said second permselective membrane forming a chemical barrier between said second and third compartments, said first electrode being positioned in said first compartment and said second electrode being positioned in said third compartment,

first, second and third pumping means,

a source of an aqueous solution of sodium hydroxide,

means including said first pumping means for producing a flow into and out of said first compartment of said aqueous solution of alkali metal hydroxide from said source thereof,

means including said second pumping means for producing a flow of electroless copper into and out of said second compartment from said plating bath,

a source of an aqueous solution of sulfuric acid,

means including said third pumping means for producing a flow into and out of said third compartment of said aqueous sulfuric acid from said source thereof, and

means to establish an electrical potential difference between said first and second electrodes with the potential on said second electrode being positive with respect to the potential on said first electrode, said first electrode comprising a dimensionally stable cathode,

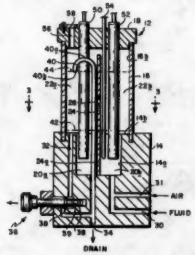
said first, second and third pumping means being substantially identical and the operation thereof such that the fluid pressures on the opposite sides of said first and said second permselective membranes are controlled and maintained substantially the same whereby to minimize the physical stresses to which said membranes are subjected as the result of solution flows into and out of said compartments.

4,600,494

ION ANALYZER CALIBRATION CELL

Edward E. A. Bromberg, Peabody; Albert Diggens, Weston; Steven J. West, Hull, and James W. Ross, Cambridge, all of Mass., assignors to Orion Research, Inc., Cambridge, Mass.

Filed Sep. 4, 1984, Ser. No. 647,313
Int. Cl.⁴ G01N *27/28*
U.S. Cl. 204—401 **8 Claims**



1. An ion-measuring instrument comprising:

A. a calibration cell for containing a solution whose ion concentration is to be measured, the calibration cell including means within said cell defining a first, monitor-mode volume and a second, calibration-mode volume;

B. means for measuring the ion concentration in solutions contained in the first and second volumes; and

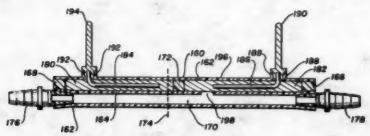
C. volume-control means having first and second states for draining from the calibration cell all liquid outside the first volume where the volume-control means is in its first state and for draining from the calibration cell all liquid outside the second volume when the volume-control means is in its second state, whereby the measuring means can measure the ion concentration in the first monitor-mode volume when the volume-control means is in its first state and can measure the ion concentration in the calibration-mode volume when the volume-control means is in its second state.

4,600,495

FLOW THROUGH ION SELECTIVE ELECTRODE

Eric J. Fogt, Maple Grove, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 519,934, Aug. 3, 1983, Pat. No. 4,565,665.
This application Aug. 15, 1985, Ser. No. 765,757
Int. Cl.⁴ G01N *27/46*
U.S. Cl. 204—409 **2 Claims**



1. A flow through ion sensing electrode, comprising:

a plastic tube having a proximal end, a distal end, an outer wall, a first lumen, a second lumen, and an inner wall separating said first lumen from said second lumen, said second lumen having first and second ends open to the exterior of said electrode, a portion of said tube including at least part of said inner wall impregnated with an ion selective material;

first sealing means for sealing the first lumen of said tube proximal to at least part of said impregnated portion of said tube;

second sealing means for sealing the first lumen of said tube distal to at least a portion of said impregnated portion of said tube;

electrolyte gel filling the first lumen of said tube intermediate said first and second sealing means; and

first electrode inserted in the first lumen of said tube intermediate said first and second sealing means.

4,600,496

PITCH CONVERSION

Paul J. Cheng, and Tammy M. Elkins, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 498,450, May 26, 1983, abandoned. This application Nov. 18, 1983, Ser. No. 553,446
Int. Cl.⁴ C10C *3/02*
U.S. Cl. 208—44 **11 Claims**

1. A process for the conversion of pitch to mesophase pitch which comprises heating pitch in the presence of a catalytically effective amount of a catalyst comprising a compound selected from the group consisting of oxides of vanadium, chromium, iron and cobalt, diketones of vanadium, chromium and nickel, carboxylates of nickel and cobalt and carbonyls of molybdenum at an elevated temperature of at least about 350° C. and for a period of time sufficient to convert the pitch to mesophase pitch.

4,600,497

PROCESS FOR TREATING WAXY SHALE OILS

John W. Ward, Yorba Linda, and Timothy L. Carlson, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 8, 1981, Ser. No. 262,031
Int. Cl.[4] C10G 45/64, 65/12
U.S. Cl. 208—89 67 Claims

1. A process for treating a waxy shale oil feedstock containing organonitrogen compounds and components boiling above about 670° F., which process comprises contacting said feedstock with a catalyst comprising a Group VIB metal component and a Group VIII metal component on a support comprising an intimate admixture of a porous refractory oxide and a crystalline zeolite having a crystal density not less than 1.6 grams per cubic centimeter, a silica-to-alumina ratio of at least 12, and a constraint index within the range of 1 to 12 at an elevated pressure and an elevated temperature less than about 800° F. and in the presence of hydrogen so as to convert less than about 25 percent of said components boiling above about 670° F. to components boiling below 670° F. and yield a product of reduced pour point and reduced organonitrogen content in comparison to said feedstock, with the reduction in organonitrogen content being over 75 percent.

4,600,498

MILD HYDROCRACKING WITH A ZEOLITE CATALYST CONTAINING SILICA-ALUMINA

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Mar. 22, 1985, Ser. No. 715,510
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.[4] C10G 47/18, 47/20
U.S. Cl. 208—111 34 Claims

1. A process for mild hydrocracking a hydrocarbon oil having a substantial proportion of components boiling below about 1,100° F., said process comprising contacting said hydrocarbon oil under conditions of elevated temperature and a hydrogen pressure less than about 1,500 p.s.i.g. with a particulate catalyst comprising at least one hydrogenation component, a crystalline aluminosilicate zeolite having catalytic activity for cracking hydrocarbons, and a dispersion of silica-alumina in a matrix consisting essentially of alumina, said conditions being such as to yield about a 10 to about a 50 volume percent conversion of the hydrocarbon oil fraction boiling above 700° F. to hydrocarbon products boiling at or below 700° F.

4,600,499

COMBINATION PROCESS FOR UPGRADING REDUCED CRUDE

William P. Hettinger, Jr., Russell, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 403,241, Jul. 29, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 638,266
Int. Cl.[4] C10G 11/00
U.S. Cl. 208—113 10 Claims

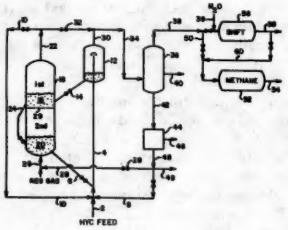
1. In a reduced crude conversion process for heavy oil feeds having Conradson carbon numbers above two, which process comprises contacting a heavy oil feed with a catalyst to form products comprising lower molecular weight hydrocarbons and coke-on-catalyst, said coke containing minor amounts of hydrogen, and thereafter regenerating said catalyst by removing at least a portion of said coke, the improvement which comprises:

(A) converting said heavy oil feed in a progressive flow riser conversion zone at an outlet temperature of about 950° F. to 1150° F. in the substantial absence of added molecular hydrogen for a period of time within the range of about 0.5 seconds to 4 seconds in the presence of a catalyst lift gas comprising gas products separated from the flue gases from said regenerating of said catalyst to produce a gasiform material comprising hydrocarbon products and hydrogen and coked catalyst;

(B) separating said coked catalyst;

(C) regenerating said coked catalyst in a regeneration zone consisting of a first regeneration stage and a second regeneration stage, wherein catalyst containing carbonaceous material initially enters said first regeneration stage and is contacted at a temperature of from about 1350° F. to 1550° F. with CO_2 rich flue gas in an amount sufficient to maintain said temperatures and to support substantial endothermic and exothermic removal of carbonaceous material by combustion with oxygen to provide partially regenerated catalyst and CO-rich flue gas;

(D) passing said partially regenerated catalyst to said second regeneration stage;



(E) contacting said partially regenerated catalyst with an excess of oxygen and water in said second regeneration stage to substantially reduce the coke on said catalyst and to provide substantial quantities of said CO_2-rich flue gas;

(F) passing said CO_2-rich flue gas into said first regeneration stage; and

(G) recovering gaseous product comprising hydrogen produced in said conversion zone separately from the hydrocarbon products of said gasiform material;

(H) subject said gaseous product comprising hydrogen to purification to provide purified hydrogen;

(I) recovering said CO-rich flue gas from said regeneration zone, said CO-rich flue gas comprising H_2, CO, CO_2, sulfur oxides, nitrogen oxides and steam;

(J) removing sulfur oxides and nitrogen oxides from said CO-rich flue gas; and

(K) combining at least a portion of said purified hydrogen and at least a portion of said CO rich flue gas to produce a synthesis gas.

4,600,500

WATER-SOLUBLE POLYAMINE ADDITIVE FOR REMOVAL OF SUSPENDED SOLIDS

Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Florham Park, N.J.

Filed Feb. 27, 1985, Ser. No. 707,004
Int. Cl.[4] C10G 29/20
U.S. Cl. 208—177 14 Claims

1. A process for removal of the suspended solids in a hydrocarbon oil fraction comprising:

providing a hydrocarbon oil fraction boiling in the range of from about 200° C. to about 550° C.;

treating said hydrocarbon oil fraction with a water-soluble agglomeration aid comprising a water-soluble polyamine of $\overline{M}w$ ranging from 200 to 2000 wherein the resulting mixture contains from 10 to 1000 weight parts per million of said aid based on the total weight of said mixture and at least an amount of water sufficient to enhance the solids removal activity of the water-soluble polyamine; and,

recovering a hydrocarbon oil bottoms portion having a reduced content of filterable solids.

4,600,501

PROCESS FOR BREAKING EMULSIONS PRODUCED DURING RECOVERY OF BITUMENS AND HEAVY OILS

Marc-Andre Poirier, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Oct. 11, 1984, Ser. No. 659,761
Claims priority, application Canada, Nov. 22, 1983, 441680
Int. Cl.[4] C10G *33/00, 33/04*
U.S. Cl. 208—188 5 Claims

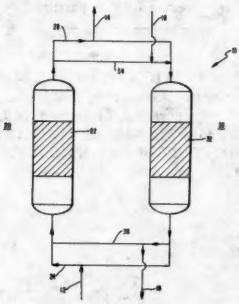
1. A process for breaking stable oil-in-water emulsions formed during recovery of bitumen or heavy oil consisting essentially of contacting the emulsion with a high-ash particulate agent having a particle size less than 60 mesh, containing at least 60% by weight of ash on a dry weight basis and selected from the group consisting of fly ash obtained from the coking of bitumen, Red mud and high ash coal rejects.

4,600,502

ADSORBENT PROCESSING TO REDUCE BASESTOCK FOAMING

Kevin D. Butler, Sarnia, and Harry E. Henderson, Edmonton, both of Canada, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 24, 1984, Ser. No. 686,071
Int. Cl.[4] C10G *19/00*
U.S. Cl. 208—284 21 Claims



1. A process for reducing foaming of a lube basestock which has been solvent extracted, and/or hydrotreated and/or dewaxed to remove aromatics, said method comprising:

(a) passing the lube basestock through an adsorption zone having adsorbent material therein; and

(b) regenerating and/or replacing adsorbent material when the foaming of the lube basestock exceeds a predetermined value.

4,600,503

PROCESS FOR HYDROTREATING RESIDUAL PETROLEUM OIL

Philip J. Angevine, West Deptford, N.J.; Thomas F. Degnan, Jr., Yardley, Pa., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 687,414, Dec. 28, 1984. This application Sep. 10, 1985, Ser. No. 774,520
Int. Cl.[4] C10G *17/00, 45/00*
U.S. Cl. 208—251 H 18 Claims

1. A method for hydrotreating residual oil which comprises contacting said oil with a hydrotreating catalyst which contains a thermally stable composition comprising a layered metal oxide containing an interspathic polymeric oxide having a d-spacing of at least about 10 angstroms, at hydrotreating conditions which include a temperature ranging from about 357° C. to 454° C. (675° F. to 850° F.) a hydrogen partial pressure of at least about 2860 kPa (400 psig) and a liquid hourly space velocity ranging between about 0.1 and 10 hr^{-1}.

4,600,504

HYDROFINING PROCESS FOR HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes; Robert J. Hogan; Daniel M. Coombs, and Jerald A. Howell, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 28, 1985, Ser. No. 695,786
Int. Cl.[4] C10G *45/06*
U.S. Cl. 208—251 H 33 Claims

1. A process for hydrofining a hydrocarbon-containing feed stream comprising the steps of:

introducing a suitable decomposable compound selected from the group consisting of compounds of the metals of Group IIB and Group IIIB of the Periodic Table into said hydrocarbon-containing feed stream; and

contacting said hydrocarbon-containing feed stream containing said decomposable compound under suitable hydrofining conditions with hydrogen and a catalyst composition comprising a support selected from the group consisting of alumina, silica and silica-alumina and a promoter comprising at least one metal selected from Group VIB, Group VIIB and Group VIII of the Periodic Table.

4,600,505

SINGLE FLOAT STEP PHOSPHATE ORE BENEFICIATION

Alexander D. Mair, and Myra M. Soroczak, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 708,914, Mar. 6, 1985, now Defensive Publication No. T106,002. This application Sep. 9, 1985, Ser. No. 773,905
Int. Cl.[4] B03D *1/02*
U.S. Cl. 209—9 21 Claims

1. An improved single stage flotation process eminently suitable for beneficiating phosphate ores containing, as impurities, silica and alkaline earth metal carbonates, which process comprises the steps of:

(a) comminutating and classifying, to predetermined size, a feed of phosphate ore containing, as impurities, silica and alkaline earth metal carbonates;

(b) conditioning the resulting, sized, phosphate ore particulate feed by subjecting same to sulfidization treatment whereby the surfaces of the minerals, comprising the phosphate values therein, are selectively sulfidized with adsorbed water insoluble metal sulfide, the metal constituent of said sulfide being substantially copper;

(c) conditioning the resulting, sulfidized, sized, phosphate ore particulate feed by contacting same with sulfide mineral collecting reagent;

(d) introducing the resulting, conditioned, particulate feed into single-stage froth flotation means, wherein are maintained oxidizing conditions, and effecting flotation thereof;

(e) recovering as product from said single stage froth flotaton means, in the overflow therefrom, a substantial portion of the phosphate values of the feed thereto; and

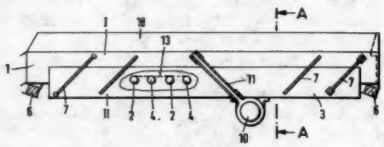
(f) simultaneously removing as byproduct from said single stage froth flotation means, in the underflow therefrom, both the resulting separated silica and the separated carbonate gangue minerals.

4,600,506

SCREENING MACHINE AND METHOD

Kurt Hoppe, Hilden, Fed. Rep. of Germany, assignor to Hein, Lehmann AG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 497,610, May 24, 1983, abandoned. This application May 2, 1985, Ser. No. 729,085
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221344
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—310 9 Claims



1. A screening machine comprising:

a first support having a pair of opposite longitudinal members bridged by a plurality of mutually spaced-apart first transverse members lying in a common first plane;

a second support having a pair of opposite longitudinal members bridged by mutually parallel spaced-apart second transverse members lying in a common second plane and alternating with said first transverse members;

oscillating means connected to said supports and including a connecting rod oriented so that the force generated thereby on one of said supports runs through the center of gravity of a movement system formed by one of said supports for displacing same and effecting relative movement of said transverse members of said supports and of said first and second planes, so that the transverse members of the two supports move toward and away from one another while being confined exclusively to linear movement in separate planes of the respective transverse members which are inclined at a given angle to said first and second planes in which the transverse members of each support lie; and

a flexible screen carried by said transverse members of both of said supports whereby said screen sags between each first and a respective second transverse member as the respective first and second transverse members of said supports approach one another and is drawn taut between respective first and second transverse members as said supports move apart.

4,600,507

FILTER DEVICE FOR LIQUIDS

Atsushi Shimizu, Tokyo, and Sadami Ohtsubo, Honmachi, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,765
Claims priority, application Japan, Oct. 6, 1983, 58-185867
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—94 20 Claims

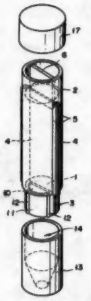
1. A filter device for use in centrifuging liquids containing at least one solid component therein, the filter device comprising:

a hollow main body having a longitudinal axis and being closed at one end thereof, and for receiving liquids therein;

at least one filter medium mounted inside said hollow main body for filtering a liquid in said hollow main body, said at least one filter medium being disposed substantially along the axis of said hollow main body and partitioning the interior of said hollow main body into at least a liquid feeding compartment and a filtrate receiving compartment;

said hollow main body including a filtrate receptacle at the bottom thereof, said filtrate receptacle being in communication with said filtrate receiving compartment;

said hollow main body having feeding means coupled to said liquid feeding compartment for feeding said liquid containing at least one solid component into said liquid feeding compartment; and



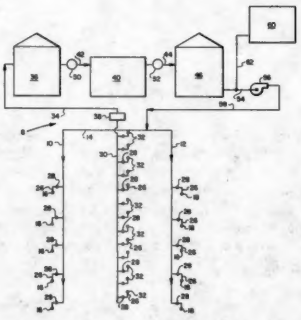
said at least one filter medium having a longitudinal length in the direction of said axis of said main body which is greater than the depth of liquid in said liquid feeding compartment, whereby during centrifuging, said liquid in said liquid feeding compartment is centrifuged and simultaneously filtered by said at least one filter medium, and a filtrate flows through said at least one filter medium and into said filtrate receiving compartment.

4,600,508

CONTAMINATION REMOVAL SYSTEM

Kenneth A. DeGhetto, Livingston, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 21, 1984, Ser. No. 581,627
Int. Cl.[4] E02B *1/00;* B01D *57/00*
U.S. Cl. 210—170 8 Claims



1. A system for removing contaminants from the ground comprising a first network of vertically extending perforated risers extending into the ground; means for pumping water through said risers for discharging the water through said perforations and into said ground such that the water absorbs the contaminants; a second network of vertically extending perforated risers disposed in said ground in the vicinity of said first network of risers; vacuum means for drawing water, along with the absorbed contaminants, through the perforations of said second network of risers; means defining at least one discharge slot at the lower end portion of each of said risers; a valve unit disposed in each riser for controlling the flow of

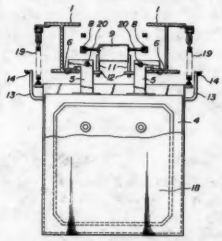
water through said riser and said slots, each valve unit including a pair of spaced valve seats, and a valve member moveable in said riser between said valve seats, said valve unit and said valve seats being configured to permit a relatively high velocity discharge of water from said slots of the risers connected to said pumping means to facilitate installation of said risers into said ground, and to prevent flow into said slots of the risers connected to said vaccuum means to prevent the ingress of solid materials into said risers; means connected to said second pipe network for removing the contaminants from said water; and means connecting the contaminant-removal means to said pumping means for recirculating said water through said first pipe network.

4,600,509

PLATE FILTER PRESS

Nobuo Sato, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Jan. 23, 1985, Ser. No. 693,990
Claims priority, application Japan, Jan. 31, 1984, 59-16740
Int. Cl.⁴ B01D *25/15*
U.S. Cl. 210—230 **5 Claims**



1. A plate filter press comprising:
a horizontal upper frame;
a plurality of filter plates suspended from said horizontal upper frame, said filter plates having at least one sliding surface which contacts said horizontal upper frame;
a driving chain located above said filter plates and extending along said horizontal upper frame;
a dogging means for contacting said filter plates, said dogging means being fixed to said driving chain; and
dogged bars fixed to said filter plates at a horizontal level which is substantially the same as said at least one sliding surface, said dogging means contacting said dogged bars to separate progressively said filter plates resulting in said filter plates being spaced apart from each other.

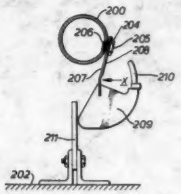
4,600,510

LIQUID TREATMENT APPARATUS

Anthony J. Butwell, Langford, England, assignor to Water Research Centre, Langford, England

Filed Apr. 4, 1985, Ser. No. 719,821
Claims priority, application United Kingdom, Apr. 6, 1984, 8408966; Jul. 10, 1984, 8417594
Int. Cl.⁴ E05B *3/12, 7/32;* E03C *1/084*
U.S. Cl. 210—273 **7 Claims**

1. An apparatus comprising hollow distributor arm for a filtration plant, which arm includes an elongate hollow member; a plurality of jets individually mounted in said hollow member spaced along its length to distribute liquid, supplied through said arm, out of the arm and over a filter; a plurality of discrete individual support members, each said support member being operatively associated with a single respective jet only, each said jet having one only discrete of said support members associated therewith; each of said support members being individually mounted externally on the arm; a plurality of discrete individual plungers; a plurality of pivotal mounting means for discretely individually pivotally mounting each of said plungers to a respective one of said support members for enabling each of said plungers to be pivotally movable with respect to its said support member independently of every



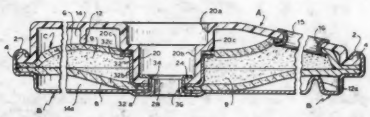
other said plunger, and for providing pivotal movement of each said plunger to cause it to move into and out of its respective said jet to keep the same clear of obstructions.

4,600,511

TWO-LAYER FLUID FILTER WITH SPACER

Victor L. Sherman, Orange, Conn., and Ojars W. Pincers, New York, N.Y., assignors to Allomatic Industries, Inc., Woodside, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,370
Int. Cl.⁴ B01D *27/08*
U.S. Cl. 210—316 **16 Claims**



1. In a fluid filter assembly comprising upper and lower walls sealingly connected to one another to define a chamber, said walls having means defining both a fluid inlet opening and a fluid outlet opening spaced therefrom, and a filter sheet sealingly received inside the chamber and comprising upper and lower layers defining therebetween a fluid receiving space in fluid communication with said inlet opening, said outlet opening being located outside said space, one of said walls having a part which extends into said chamber through said filter sheet, toward the other of said walls, the improvement which compses a first sealing relationship between one of said filter sheet layers and said wall part, a spacer surrounding a vertical portion of said wall part and extending toward said one of said walls and terminating in a spacer abutment surface, and a second sealing relationship between the other of said filter sheet layers and said abutment surface and said one wall, whereby said layers of said filter sheet are positively spaced from one another at said wall part.

4,600,512

REVERSE OSMOSIS WATER PURIFICATION MODULE

James D. Aid, St. Petersburg, Fla., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

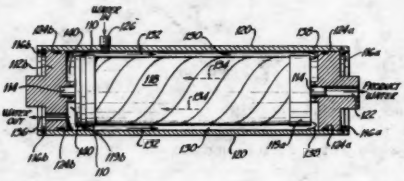
Continuation of Ser. No. 447,856, Dec. 8, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 710,519
Int. Cl.⁴ B01D *13/00*
U.S. Cl. 210—433.2 **6 Claims**

5. A water purifying membrane module comprising:
a pressure vessel including a cylinder having first and second end plugs;
a cylindrical membrane assembly containing a water purifying membrane having an impervious outer surface and fluid openings into said cylindrical membrane assembly at the ends thereof for passing water to be treated into the assembly and untreated water out of the assembly and

including a separate opening for emitting product water from the assembly;

said assembly being mounted within said pressure vessel between said end plugs whereby a space is formed between said assembly and said pressure vessel at said assembly ends and about said assembly;

a seal surrounding the assembly and in fluid tight contact with the outer surface of the assembly and the inner surface of the pressure vessel defining first and second spaces,



said first space being in fluid communication with said untreated water inlet and said second space being in fluid communication with said untreated water fluid outlet, said seal being positioned to minimize the volume of said second space in relation to said first space; and

a second untreated water port passing through said pressure vessel into said first space in close proximity to said seal whereby the volume of said first space between said seal and said second untreated water port will be minimized in relation to the rest of said first space.

4,600,513

COMPOSITION FOR THE CLARIFICATION AND DETACKIFICATION OF PAINT SPRAY BOOTH WASTES

Akihiko Mizutani, Ohita; Hiroyoshi Murayama, Tokyo; Kohsaku Arakawa, and Saburo Tanaka, both of Mie, all of Japan, assignors to Hakuto Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,823

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—712 **6 Claims**

1. A process for controlling contamination in a wet paint spray booth in which water is used to wash air in said booth, and to remove over-sprayed paints, said water being recirculated for further use in washing the air in said spray booth, said process comprising:

adding to said water an effective amount of a detackifying treatment composition comprising an alkali metal zincate, substantially free of chloride ions and sulfate ions, dissolved in an aqueous alkali metal hydroxide solution at pH 8–11, said alkali metal being sodium, potassium or lithium, and said composition being effective to condition paint solids so as to facilitate removal of said solids from said water, and

gradually lowering the pH of said water by absorbing CO_2 from air or neutralization by organic acids formed by degradation of organic materials in said paint by aerobic bacteria.

4,600,514

CONTROLLED GEL TIME FOR SOLIDIFICATION OF MULTI-PHASED WASTES

Jesse R. Conner, Atlanta, Ga., assignor to Chem-Technics, Inc., Atlanta, Ga.

Filed Sep. 15, 1983, Ser. No. 532,615

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—751 **15 Claims**

1. A method of controlling the gelling time during the solidification of liquid and semi-liquid wastes, comprising the steps of:

admixing the waste with cement, a powdered alkali metal silicate, and a liquid alkali metal silicate in relative quantities sufficient to cause the admixture to gell and set to a sedentary mass,

the relative proportion of said powdered alkali metal silicate to said liquid alkali metal silicate being selected to cause the admixture to gel within a predetermined time; and

thereafter allowing the admixture to set to a sedentary mass.

4,600,515

FLUID LOSS CONTROL AGENTS FOR DRILLING FLUIDS CONTAINING DIVALENT CATIONS

Patricia A. Gleason, Westfield, and Chester D. Szymanski, Martinsville, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sep. 12, 1984, Ser. No. 650,316

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.5 A **20 Claims**

1. A drilling fluid comprising:

a. an aqueous solution containing at least 10,000 parts per million of a divalent metal cation;

b. a water-in-oil emulsion copolymer of monomers consisting of acrylamide and a water-soluble salt of acrylic acid wherein the acrylamide and acrylic acid are present in a molar ratio of about 70:30 to 95:5, the copolymer having a molecular weight of at least one million; and

c. at least about 0.25 pounds per barrel of a particulate bridging solid capable of forming a filter cake against an exposed permeable formation;

wherein b and c are present in amounts sufficient to reduce fluid loss during drilling.

4,600,516

SULFONATED TRIBUTYLPHENOL ETHOXYLATES, THEIR USE, AND A PROCESS FOR PREPARING SULFONATED ALKOXYLATES

Norbert Wester, Hofheim am Taunus; Klaus Uhl, Bad Soden am Taunus; Walter Gulden, Hofheim am Taunus, and Gerhart Schneider, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 15, 1984, Ser. No. 580,436

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305328; Dec. 23, 1983, 3346676

Int. Cl.[4] C09K *3/00*; C07C *143/42, 143/02*

U.S. Cl. 252—8.55 R **6 Claims**

1. A process for preparing sulfonated alkoxylates of the formula

$$R—(O—A)_n—SO_3M$$

in which R denotes C_8–C_{22}-alkyl or phenyl or naphthyl, both of which can be substituted by 1 to 3 C_1–C_{15}-alkyl, A denotes an ethylene or an isopropylene group, n denotes a number from 3 to 30 and M denotes sodium or potassium, which comprises reacting a compound of the formula

$$R—(O—A)_n—Hal$$

in which Hal denotes a halogen atom, in aqueous solution with sodium sulfite or potassium sulfite in the presence of monoethylene, diethylene or triethylene glycol.

4,600,517

GREASE COMPOSITION CONTAINING BORONATED ALCOHOLS, AND HYDROXY-CONTAINING THICKENERS

John P. Doner, Sewell; Andrew G. Horodysky, Cherry Hill, and John A. Keller, Jr., Pitman, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,346

Int. Cl.[4] C10M *157/10*

U.S. Cl. 252—32.7 E **29 Claims**

1. An improved grease composition comprising a major

amount of a grease and from about 0.01% to about 10% by weight of the composition of a reaction product made by reacting an alcohol of the formula

ROH

wherein R is a hydrocarbyl group or mixture thereof, containing from 10 to 30 carbon atoms with a boron compound selected from the group consisting of boric acid, boric oxide, a metaborate and an alkyl borate of the formula

$(R^1—O)_xB(OH)_y$

wherein x is 1 to 3, y is 0 to 2, their sum being 3, and R^1— is an alkyl group having 1 to 6 carbon atoms said grease being thickened with a thickener containing at least about 15% by weight of a hydroxy-containing thickener.

4,600,518

CHOLINE FOR NEUTRALIZING NAPHTHENIC ACID IN FUEL AND LUBRICATING OILS

Donald G. Ries, Richmond, and Glenn L. Roof, Sugar Land, both of Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Jul. 15, 1985, Ser. No. 754,720
Int. Cl.[4] C10M *105/08;* C10C *1/22*
U.S. Cl. 252—34 2 Claims

1. A method of neutralizing at least a portion of the naphthenic acids present in fuel and lubricating oils which contain naphthenic acids which comprises treating these oils with a neutralizing amount of choline.

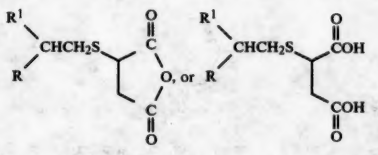
4,600,519

PROCESS FOR IMPROVING FRICTION MODIFICATION PROPERTIES OF A POWER TRANSMISSION FLUID WITH AN ALKYLTHIO SUCCINIC ACID OR ANHYDRIDE

Antonio Gutierrez, Mercerville; Rosemary O'Halloran, Union, and Stanley J. Brois, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 464,950, Feb. 8, 1983. This application Mar. 29, 1985, Ser. No. 717,554
Int. Cl.[4] C10M *135/26*
U.S. Cl. 252—48.6 3 Claims

1. A process for improving the friction modification properties of a power transmitting fluid comprising a major amount of mineral oil of lubricating viscosity and a friction modifying agent which comprises employing as the friction modifying agent from about 0.01 to about 1 wt%, based on the weight of the power transmitting fluid, of at least one compound represented by structural formulas:



wherein, R' is an alkyl of about 8 to 30 carbon atoms and R is a lower C_{1-4} alkyl or hydrogen.

4,600,520

BORATED ADDUCTS OF DIAMINES AND ALKOXIDES AS MULTIFUNCTIONAL LUBRICANT ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1983, Ser. No. 566,069
Int. Cl.[4] C10M *1/36*
U.S. Cl. 252—49.6 24 Claims

1. A reaction product produced by (1) reacting a hyrocarbyl or hydrocarbyloxydiamine or mixtures thereof with an alkoxide or mixtures thereof in molar ratios of from about 2:1 to about 1:2 at temperatures of from about 70° to 250° C. followed by (2) borating the product of (1) with substantially stoichiometric amounts of a boron compound or up to a 100% excess of a boron compound selected from the group consisting essentially of boric acid, a trialkyl boron compound or an ester of a boric acid.

4,600,521

ELECTRON-BEAM REACTIVE MAGNETIC COATING COMPOSITION FOR MAGNETIC RECORDING MEDIA

Eitaro Nakamura, Tokyo; Kotaro Hata, Ichikawa, and Makoto Yamamoto, Hiratsuka, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,660
Claims priority, application Japan, Oct. 9, 1984, 59-211645; Oct. 31, 1984, 59-229657
Int. Cl.[4] C04B *35/04*
U.S. Cl. 252—62.54 13 Claims

1. An electron-beam reactive magnetic coating composition for use in magnetic recording media comprising a magnetic powder and a polymer resin as a binder therefor, the polymer resin containing vinyl chloride as a main component and having at least one hydrophilic group selected from the group of COOM, SO_3M, SO_4M, PO_3M_2 and PO_4M_2 (wherein M represents hydrogen, an alkali metal or ammonium) and not more than 10,000 double bond equivalents of an unsaturated acid ester group.

4,600,522

DETERGENT CLEANING COMPOSITION

John A. Grzeskowiak, Jr., Tottenville, N.Y., and Elliott E. Hershkowitz, Fair Lawn Township, Bergen County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 341,439, Jan. 22, 1982, abandoned. This application Apr. 26, 1982, Ser. No. 371,625
Int. Cl.[4] B08B *3/08;* C09D *9/00;* C11D *7/50;* C23G *5/02*
U.S. Cl. 252—170 11 Claims

1. A non-toxic, non-corrosive, caustic-free cleaning composition comprising:
(a) 20–90 weight parts of a mixture of furfuryl alcohol and tetrahydrofurfuryl alcohol;
(b) 5–15 weight parts of an odor masking and degreasing oil;
(c) 5–15 weight parts of a surfactant of the type derived from the condensation of a 10 to 18 carbon alcohol with 1 to 6 moles ethylene oxide; and
(d) 5–8 weight parts of an emulsifier.

4,600,523

HYDROXYALKYL POLYETHYLENE GLYCOL ETHER FOAM INHIBITORS

Robert Piorr, Ratingen; Hans-Joachim Schluessler, Haan, and Peter Nikolaus, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 13, 1984, Ser. No. 681,766
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345349
Int. Cl.[4] C11D *1/72*
U.S. Cl. 252—174.22 13 Claims

1. A method of inhibiting foam in an aqueous cleaning prepa-

ration or a solid or liquid concentrate for preparation of the same, comprising incorporating therein a foam-inhibitive effective amount of at least one first compound of the formula

$$R^1—CHOH—CHR^2—O—(CH_2CH_2O)_n—R^3$$

wherein:

R^1 is a straight-chain C_{6-16}-alkyl;

R^2 is H or a C_{1-8}-alkyl;

R^3 is a straight-chain or branched C_{4-8}-alkyl; and

n is a number average of about 7 to 12;

with the proviso that the total number of carbon atoms in R^1 and R^2 is between 6 and 16.

4,600,524

COMPOSITION AND METHOD FOR INHIBITING SCALE

Dionisio G. Cuisia, Chicago, and Chih M. Hwa, Palantine, both of Ill., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 8, 1983, Ser. No. 559,517
Int. Cl.[4] C02F *5/14*
U.S. Cl. 252—181 **6 Claims**

1. A composition for controlling scale in an aqueous steam generating boiler system comprising scale inhibiting amounts of a mixture consisting essentially of:

(1) a copolymer of maleic acid and allyl sulfonic acid or a water soluble salt thereof, said copolymer having a molecular weight of from about 800 to about 25,000 and an allyl sulfonic acid to maleic acid mole ratio of about 1:3 to 3:1;

(2) from about 0.25 to about 4 parts by weight, per part by weight of said copolymer or copolymer salt, of hydroxyethylidene-1,1-diphosphonic acid or a water soluble salt thereof; and

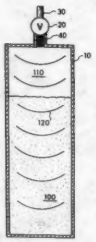
(3) from about 500 to about 0.1 parts by weight, per part by weight of said copolymer or copolymer salt, of a water soluble sodium phosphate hardness precipitating agent.

4,600,525

HYDROGEN SORBENT FLOW AID COMPOSITION AND CONTAINMENT THEREOF

Nathaniel R. Baker, 748 Cook St., Denver, Colo. 80206, and Franklin E. Lynch, Rte. 1, Box 574, Conifer, Colo. 80433

Filed Jul. 21, 1982, Ser. No. 400,440
Int. Cl.[4] C01B *31/16*
U.S. Cl. 252—184 **14 Claims**



1. A hydrogen sorbent composition comprising a mixture of:

powdered hydrogen sorbent alloy, and

a flow aid, said powdered flow aid being uniformly mixed with said sorbent alloy, said powdered lubricant being capable of improving the flow characteristics to said sorbent alloy by reducing settling, densification and stress buildup in said hydrogen sorbent alloy.

4,600,526

LIPOPEPTIDES, THEIR PREPARATION AND THEIR APPLICATION AS EMULSIFIERS

Bernard Gallot, and André Douy, both of Olivet, France, assignors to Centre National de la Recherche Schientifique (C N R S), Paris, France

Filed Sep. 16, 1983, Ser. No. 533,428
Claims priority, application France, Sep. 22, 1982, 82 15976
Int. Cl.[4] C09K *19/52;* B01J *13/00*
U.S. Cl. 252—299.01 **15 Claims**

1. An amphiphatic lipopeptide of the formula

$$CnSar_p$$

wherein

Cn is a hydrophobic aliphatic amine having n carbon atoms,

n is a whole number from 8 to 24, inclusive,

Sar is a unit which has the structure of sarcosine linked through a peptide linkage to Cn or to another Sar, and

p defines the degree of polymerization and is a positive whole number of at least one.

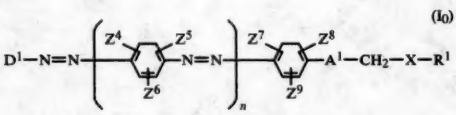
4,600,527

LIQUID CRYSTAL COMPOSITION

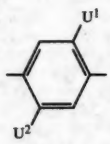
Shuji Imazeki; Akio Mukoh; Mikio Sato, all of Ibaraki; Masaharu Kaneko; Tomio Yoneyama, both of Kanagawa, and Junko Iwanami, Kanagawa, all of Japan, assignors to Mitsubishi Chemical Industries and Hitachi Ltd., both of Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,391
Claims priority, application Japan, Feb. 10, 1982, 57-20129
Int. Cl.[4] C09K *3/04;* G02F *1/13*
U.S. Cl. 252—299.1 **5 Claims**

1. A liquid crystal composition containing azo dyes represented by the formula (I_0)

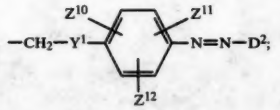


wherein X represents



A^1 represents —NH—;

R^1 represents an alkyl group, an alkoxyalkyl group, an aryloxyalkyl group, a dialkylaminoalkyl group, an arylaminoalkyl group, an alkoxy group, an alkoxyalkoxy group, an arylalkoxy group, an aryl group, a halogen atom or a group of



D^1 and D^2 each represents an aromatic group which does not contain an ionic group;

U^1 and U^2 each represents a hydrogen atom, a halogen atom, a methyl group, a methoxy group or an ethoxy group;

Y^1 represents —O— or

R represents a hydrogen atom, an alkyl group or an alkyl group connected to Z^{10} to Z^{12} to form a ring;

Z^4 to Z^{12} each represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a hydroxy group, an acylamino group or a cyano group, or Z^4 and Z^5, Z^7 and Z^8, and Z^{10} and Z^{11} may be connected to each other to form an aromatic ring; and

n represents 0, 1 or 2; with the proviso that the dye does not contain a cyclohexyl group.

4,600,528
DECALIN-CARBONITRILES

Rudolf Eidenschink, Dieburg, and Georg Weber, Erzhausen, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

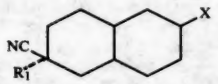
Filed Jun. 1, 1984, Ser. No. 616,441

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1983, 3319781

Int. Cl.[4] C09K *3/34;* **G02F** *1/13;* **C07D** *319/06;* **C07C** *121/46, 121/00*

U.S. Cl. 252—299.61 **12 Claims**

1. A decalin-carbonitrile of the formula



wherein

R^1 is α—C_{1-10}—alkyl, and the 2—CN group is in the the β-configuration;

X is a radical selected from the group consisting of alkyl, alkoxy, 4-alkylcyclohexyl, 5-alkyl-1, 3-dioxanyl, 4-alkylcyclohexane-carbonyloxy, 2-alkyl-pyrimidine-5-carbonyloxy, p-R^2-phenyl carbonyloxy, p-R^2-phenyl, and p-R^2-phenoxymethyl; R^2 is alkyl, alkyl with one or two non-adjacent CH_2 groups replaced by O atoms, F, Cl, Br, CN, —O—COR^3, —$COOR^3$, or H and

R^3 is alkyl of 1 to 6 C atoms;

or an acid addition salt of said compounds which are basic.

4,600,529
DEHYDROGENATION OF ALCOHOLS USING ALKALI CARBONATE CATALYSTS

Richard T. Hallen, Richland, and L. John Sealock, Jr., West Richland, both of Wash., assignors to Gas Research Institute, Chicago, Ill.

Filed Sep. 19, 1983, Ser. No. 533,851

Int. Cl.[4] C07C *1/02*

U.S. Cl. 252—373 **12 Claims**

1. A process for dehydrogenation of methanol, which process comprises heating methanol in the presence of a catalytic amount of an active catalyst consisting essentially of an alkali metal carbonate.

4,600,530
AEROSOL CORROSION INHIBITORS

Philip L. Bartlett, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1985, Ser. No. 716,479

Int. Cl.[4] C09K *3/30*

U.S. Cl. 252—392 **12 Claims**

1. In an aerosol composition containing an aqueous aerosol-dispersible medium and a propellant, the improvement which comprises the presence of a corrosion inhibiting composition comprising 15 to 85 wt. % of a nitroalkane containing 1–3 carbon atoms and 85 to 15 wt. % of a tertiary C_{12-14} alkylammonium carboxylate selected from the group consisting of a tertiary C_{12-14} alkylammonium benzoate and a tertiary C_{12-14} alkylammonium-N-oleoyl sarcosinate, said corrosion inhibiting composition being present in an amount sufficient to prevent more than light corrosion of a tin-plated steel aerosol can containing said aerosol composition.

7. In an aerosol propellant for use in a water-based aerosol composition, the improvement which comprises the presence of a corrosion inhibiting composition comprising 15 to 85 wt. % of a nitroalkane containing 1–3 carbon atoms and 85 to 15 wt. % of a tertiary C_{12-14} alkylammonium carboxylate, said corrosion inhibiting composition being present in an amount sufficient to prevent more than light corrosion of a tin-plated steel aerosol can containing said aerosol composition.

4,600,531
PRODUCTION OF ALPHA-ALPHA CROSS-LINKED HEMOGLOBINS IN HIGH YIELD

Joseph A. Walder, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Iowa City, Iowa

Continuation-in-part of Ser. No. 625,360, Jun. 27, 1984. This application Mar. 18, 1985, Ser. No. 713,348

Int. Cl.[4] C07K *13/00;* **A61K** *35/14*

U.S. Cl. 530—385 **14 Claims**

1. A method of producing in commercially significant yields, a modified hemoglobin which is capable of functioning as a blood substitute and blood plasma expander, comprising:

isolating unmodified hemoglobin or preparing a crude red cell lysate;

deoxygenating said hemoglobin;

cross-linking said deoxygenated hemoglobin intramolecularly between Lys 99 $Alpha_1$ and Lys 99 $Alpha_2$ in the presence of an added polyanion selected from the group consisting of 2,3-diphosphoglycerate, inositol hexaphosphate, inositol hexasulfate; and

purifying said alpha-alpha cross-linked hemoglobin.

4,600,532
PROCESS AND COMPOSITION FOR AMINO-TERMINAL, α-ASPARTYL AND α-GLUTAMYL DIPEPTIDES AND DIPEPTIDE ESTERS

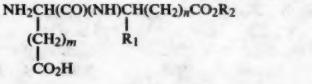
Emil T. Kaiser, New York, N.Y., and Gary F. Musso, San Diego, Calif., assignors to The Salk Institute Biotechnology/Industrial Associates, Inc., San Diego, Calif.

Filed Dec. 28, 1984, Ser. No. 687,475

Int. Cl.[4] C07K *00/00*

U.S. Cl. 260—998.21 **20 Claims**

1. A process for making a compound of formula I, or a salt thereof,

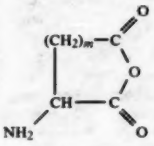


I

wherein m is 1 or 2; wherein, when m is 2, n is 0, R_1 is —CH_2.C(O)NH_2, and R_2 is hydrogen; wherein, when m is 1, n is 0, 1 or 2; wherein, when m is 1 and n is 0, R_1 is benzyl, p-hydroxybenzyl, p-methoxybenzyl, p-ethoxybenzyl, methylthiomethyl, methylthioethyl, methylsulfonylethyl, or —$CH_2O(CO)R_3$, wherein R_3 is methyl, ethyl, n-propyl or i-propyl; wherein, when n is 1 or 2, R_1 is hydrogen or methyl; wherein, if R_1 is benzyl, p-hydroxybenzyl or methylthioethyl, R_2 is methyl, ethyl, n-propyl, i-propyl or t-butyl; wherein, if R_1 is hydrogen or methyl, R_2 is methyl, ethyl, n-propyl or i-propyl; wherein, if R_1 is p-methoxybenzyl, p-ethoxybenzyl, methylthiomethyl, methylsulfonylethyl or —$CH_2O(CO)R_3$, R_2 is methyl or ethyl; wherein the configuration of the amino-terminal aspartyl or

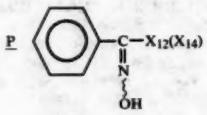
glutamyl group is L; and wherein the configuration at the carbon to which R_1 is bonded is L, if n is 0, and D, if n is 1 or 2 and R_1 is methyl, which comprises:

(i) making a ketoxime ester-derivatized polymer by reacting a strong acid salt of a compound of formula II



II

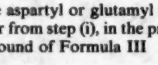
wherein m is as in the compound of formula I and the configuration at the asymmetric carbon is L or D,L, with a ketoxime-derivatized polymer, wherein the ketoxime-derivatized sites are represented by formula IV



IV

wherein P represents the polymer backbone of the resin; wherein the phenylene group is a repeating functional group in the corresponding underivatized polymer; wherein X_{12} is (i) phenyl, optionally substituted at any one position with chlorine; bromine; iodine; alkoxy, wherein the alkyl moiety is of 1 to 6 carbon atoms; sulfonyl; nitro; or trialkylamino, wherein the alkyl groups are the same or different and are each of 1 to 4 carbon atoms; (ii) alkyl of 1 to 6 carbon atoms; (iii) cycloalkyl of 3 to 8 carbon atoms; or (iv) a heterocyclic moiety consisting of 3 or 4 carbon atoms in the ring, an atom or group selected from oxygen, nitrogen, sulfur and sulfonyl in the ring, and a CH group in the ring and bonded to the ketoxime carbon atom; and wherein X_{14} is a counterion to any positive charge that is present on X_{12} and is the conjugate base of a strong acid; and

(ii) reacting the aspartyl or glutamyl ketoxime ester-derivatized polymer from step (i), in the presence of a weak acid, with a compound of Formula III



III

wherein n and R_1 are as in the compound of formula I; wherein, if R_2 in the corresponding compound of Formula I is not hydrogen, R_4 is the same as R_2; wherein, if R_2 in the corresponding compound of formula I is hydrogen, R_4 is a cation, corresponding to a base of which the compound of Formula III is a salt, provided that said base is strong enough to maintain a substantial fraction of the compound of formula III in the free amine form but not so strong or nucleophilic as to cause significant racemization of the compound of formula III; and wherein the configuration at the asymmetric carbon is L or D,L, if n is 0, and D or D,L, if n is 1 or 2 and R_1 is methyl.

4,600,533

COLLAGEN MEMBRANES FOR MEDICAL USE

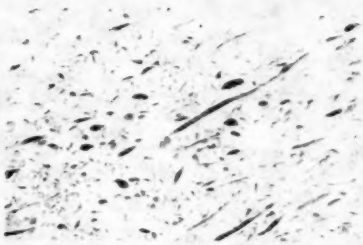
George Chu, Sunnyvale, Calif., assignor to Collagen Corporation, Palo Alto, Calif.

Filed Dec. 24, 1984, Ser. No. 685,350

Int. Cl.[4] C07K *15/20*; C07G *7/00*; C08H *1/06*

U.S. Cl. 530—356 **8 Claims**

1. A process for preparing a collagen membranous material which comprises compressing a collagen gel matrix with constant pressure using 1.1–3 atmospheres pressure, and continued



until the volume is approximately less than 5% of the original gel to form a fiber network, and drying said network.

4,600,534

PROCESS AND INTERMEDIATES FOR MANUFACTURE OF 3-(5-AMINO-1-CARBOXYPENTYLAMINO)-TETRAHYDRO-1-BENZAZEPIN-2-ONE-1-ACETIC ACID

Joseph Bach, Parsippany, and Stephen K. Boyer, Far Hills, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

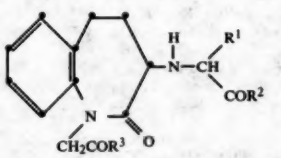
Filed Oct. 18, 1984, Ser. No. 662,313

Claims priority, application European Pat. Off., Feb. 6, 1984, 84810072.3

Int. Cl.[4] C07D *223/16*, *401/12*

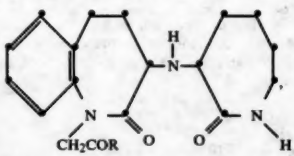
U.S. Cl. 260—239.3 B **16 Claims**

1. A process for the preparation of a compound of the formula



(I)

wherein R^1 represents 4-aminobutyl, COR^2 and COR^3 represent carboxy; or a pharmaceutically acceptable salt thereof; which comprises ring opening the monocyclic lactam in a compound of the formula



(II)

wherein COR represents carboxy or esterified carboxy, and hydrolysis of the esterified carboxy group when COR represents esterified carboxy; esterified carboxy comprising lower alkoxycarbonyl, benzyloxycarbonyl, benzyloxycarbonyl substituted in the phenyl ring by lower alkyl, halogen or lower alkoxy, or pyridylmethoxycarbonyl.

4,600,535

CYCLIC PEPTIDES

Donald A. Tomalia, and Larry R. Wilson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 348,528, Feb. 12, 1982. This application Oct. 9, 1984, Ser. No. 659,201
Int. Cl.[4] C07D *257/02*
U.S. Cl. 260—239.3 R 5 Claims

1. A process for preparing a cyclic peptide corresponding to the formula

$$NHCRHCRHNHCH_2CR'HC(O)_2$$

comprising contacting an acrylic ester of the formula $CH_2{=}CR'CO_2R''$ with a 1,2-alkylenediamine of the formula $NH_2CRHCRHNH_2$ wherein R and R' are independently each occurrence hydrogen or C_{1-4} alkyl, and R'' is C_{1-8} alkyl under reaction conditions conductive to the formation of a Michael addition product and thereafter subjecting the Michael addition product to a temperature between about 10° C. and about 60° C. for a time sufficient to form the cyclic peptide.

4,600,536

EXPLOSIVE COMPOUND

Andrew P. Chafin, Levittown, Pa., and Arnold T. Nielsen, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 19, 1984, Ser. No. 662,868
Int. Cl.[4] C07C *117/00*
U.S. Cl. 260—349 2 Claims

1. A method for producing alpha-pentanitrophenyl azide comprising the steps of:

dissolving pentanitrophenyl azide in carbon tetrachloride to form a saturated solution; and

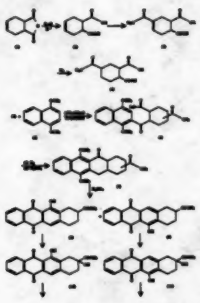
recrystallizing to yield the alpha product.

4,600,537

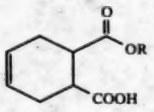
PREPARATION OF (±) 4-DEMETHOXY-6 (AND-11-)-DEOXYDAUNOMYCINONE

Francesco Angelucci; Sergio Penco, both of Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Italy

Division of Ser. No. 382,144, May 26, 1982, Pat. No. 4,465,671. This application Apr. 11, 1984, Ser. No. 599,015
Claims priority, application United Kingdom, May 28, 1981, 8116264; Aug. 22, 1981, 8125949
Int. Cl.[4] C07C *49/423;* C07D *307/89*
U.S. Cl. 260—351.1 3 Claims

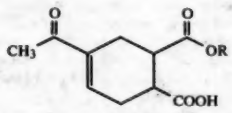


1. A process for preparing a racemic aglycone, said process comprising reacting 1,2,3,6-tetrahydrophthalic anhydride with an alcohol of the formula ROH wherein R is lower alkyl, substituted lower alkyl or aryl to form the monoester of the formula (2):



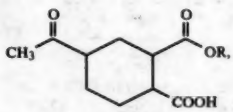
(2)

wherein R is as defined above, subjecting the monoester (2) to a Friedel-Crafts reaction with acetyl chloride, followed by mild alkaline treatment, to give the corresponding α,β unsaturated ketone (3):



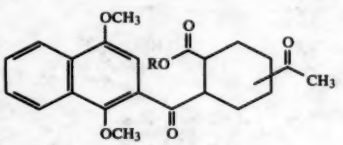
(3)

catalytically reducing (3) to form the corresponding 4-acetylperhydrophthalate (4)



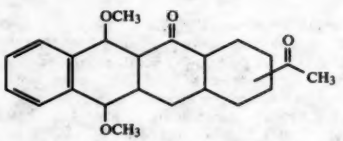
(4)

reacting (4) with 1,4-dimethoxynaphthalene in the presence of trifluoroacetic anhydride and trifluoroacetic acid to form a mixture of two isomeric compounds of formula (6)



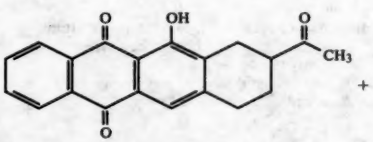
(6)

submitting said mixture of isomers (6) to a catalytic reduction of the benzylic carbonyl function, followed by treatment thereof with sulphuric acid at room temperature, to afford a mixture of the tetracyclic isomers of formula (7):



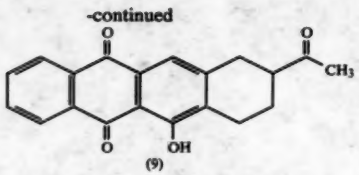
(7)

treating the mixture (7) with sulphuric acid at 80° C. for one hour to give 1:1 mixture of the racemic anthracyclinones (8) and (9):



(8)

-continued



(9)

treating said mixture first with boiling acetic anhydride in the presence of p-toluene-sulphonic acid and then with m-chloroperbenzoic acid at room temperature for 2 hours to form a diastereomeric mixture of racemic (±)4-demethoxy-6,7-dideoxydaunomycinone and racemic (±)4-demethoxy-7,11-dideoxydaunomycinone, separating said diastereomeric mixture by chromatography on silica gel and treating each separately obtained racemic compound, separately, with ethylene glycol, in refluxing benzene and in the presence of p-toluene-sulphonic acid to obtain the corresponding 13 ketals, subjecting the 13-ketals to a benzylic bromination, by treatment with bromine in carbon tetrachloride in the presence of 2,2'-azo-bis-isobutyronitrile, followed by hydrolysis of the ketal group by means of an aqueous solution of hydrogen chloride in acetone, at room temperature for three hours to obtain, separately, the racemic (±)4-demethoxy-6-deoxy-daunomycinone and racemic (±)4-demethoxy-11-deoxydaunomycinone.

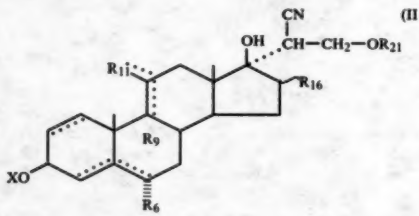
4,600,538

CORTICOSTEROIDS FROM 17-KETO STEROIDS VIA 20-CYANO-$\Delta^{17(20)}$-PREGNANES

Jerry A. Walker, Oshtemo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 2, 1984, Ser. No. 636,948
Int. Cl.[4] C07J 5/00
U.S. Cl. 260—397.45 **18 Claims**

1. A 17β-hydroxy-steroid of the formula



(II A-C)

and C_3 protected forms thereof where

X is a hydrogen atom or nothing; when X is nothing the between XO and C_3 is a double bond, when X is a hydrogen atom the between XO and C_3 is a single bond;

R is alkyl of 1 thru 6 carbon atoms or phenyl;

R' is alkyl of 1 thru 6 carbon atoms or phenyl;

R'' is alkyl of 1 thru 6 carbon atoms or phenyl;

R_6 is a hydrogen or fluorine atom or methyl group;

R_9 is nothing, a hydrogen, fluorine or oxygen atom which makes the C ring

(a) $\Delta^{9(11)}$ when R_9 is nothing and

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are an oxygen atom;

R_{11} is a hydrogen or oxygen atom, two hydrogen atoms, or α- or β-hydroxyl droup which makes the C-ring

(a) $\Delta^{9(11)}$ when R_{11} is a hydrogen atom,

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are an oxygen atom and ⋯ between C_{11} and R_{11} is a single bond, and

(c) a ketone when R_{11} is an oxygen atom and ⋯ between C_{11} and R_{11} is a double bond;

R_{16} is a hydrogen atom or methyl group;

R_{21} is a hydrogen atom, —CO—R_{21}', —SiRR'R'' or M';

R_{21}' is alkyl of 1 thru 5 carbon atoms or phenyl;

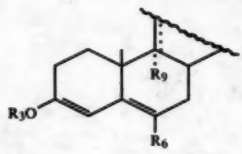
— indicates that the attached group can be in either the α or β configuration;

⋯ is a single or double bond;

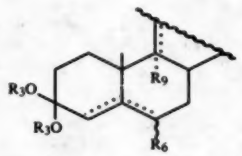
M' is a lithium, sodium or potassium ion

where the Δ^4-3-keto 17β-hydroxy steroid (II A) is in the C_3 protected form

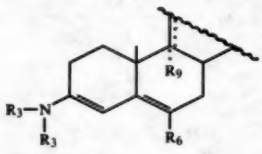
(Aa)



(Ab)



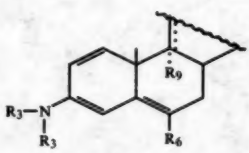
(Ac)



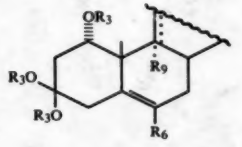
where R_3 is alkyl of 1 thru 5 carbon atoms with the proviso that with the detal (Ab) and the enamine (Ac), the R_3 groups can be the same or different and can be connected and with the enamine (Ac) is cyclized the ring can contain hetero atoms

where the $\Delta^{1,4}$-3-keto 17β-hydroxy steroid (II B) is in the C_3 protected form

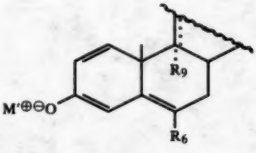
(Ba)



(Bb)



(Bc)



4,600,539

O/W EMULSIFIERS FOR COSMETIC PURPOSES

Udo Hoppe, Hamburg; Jochen M. Quack, Eppstein; Alwin Reng, Kelkheim; Herbert Stühler, Burgkirchen/Alz, and Klaus-Peter Wittern, Schenefeld, all of Fed. Rep. of Germany, assignors to Beiersdorf AG, Hamburg and Hoechst AG, Frankfurt, both of, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,004

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1983, 3338890

Int. Cl.[4] C11C *3/02*

U.S. Cl. 260—410.7 6 Claims

1. A novel O/W emulsifier for cosmetic purposes based on polyethoxylated wool wax derivatives obtainable by reacting one mole of esters of wool wax acids and glycerol with 0.5 to 30 moles of ethylene oxide.

4,600,540

BENZOYLPROPIONIC ACID DERIVATIVES

Kazuyuki Tomisawa, Saitama; Kazuya Kameo; Toru Matsunaga, both of Ageo; Shiuji Saito, Niiza, and Kaoru Sota, Tokorozawa, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

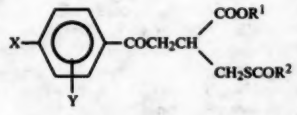
Filed Jun. 4, 1985, Ser. No. 741,127

Claims priority, application Japan, Jun. 5, 1984, 59-114887

Int. Cl.[4] C07C *153/023*

U.S. Cl. 558—255 6 Claims

1. Benzoylpropionic acid derivatives represented by the general formula



(wherein, R^1 represents a hydrogen atom, a lower alklyl group or a benzyl group, R^2 represents a lower alkyl or a phenyl group, X represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a phenoxy group or a halogenophenoxy group, and Y represents a hydrogen atom or a lower alkyl group.

4,600,541

PROCESS FOR THE PREPARATION OF ACRYLONITRILE OR METHACRYLONITRILE

Kunitoshi Aoki, Kawasaki, and Shigeo Nakamura, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 603,537, Apr. 25, 1984, abandoned. This application Nov. 1, 1985, Ser. No. 794,323

Claims priority, application Japan, May 6, 1983, 58-78290

Int. Cl.[4] C07C *120/14*

U.S. Cl. 558—321 16 Claims

1. A process for the preparation of acrylonitrile or methacrylonitrile comprising contacting at a temperature of 400° to 500° C. propylene or isobutylene with ammonia and molecular oxygen in the vapor phase in the presence of an oxide catalyst consisting essentially of 30 to 70% by weight of silica and supported thereon oxides of molybdenum, bismuth, iron and an ingredient A, said ingredient A being at least one element selected from the group consisting of palladium, platinum, osminum and iridium, the atomic ratio of molybdenum, bismuth, iron and the ingredient A being Mo:Bi:Fe:A = 12:0.5 to 10:0.5 to 10:0.002 to 0.2, said catalyst having been calcined at 600° to 710° C., no calcination being effected at a temperature of higher than 710° C., before and after said calcination.

4,600,542

SULPHONATION PRODUCTS OF NAPHTHALENE, PROCESSES FOR THEIR PREPARATION, AND THEIR USE

Otto Lindner, Bergisch-Gladbach; Heinrich Pelster; Guido Steffan, both of Odenthal, and Arnd Stiiwe, Leverkusen, all of Fed. Rep. of Germany, assignors to Kramer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 96,083, Nov. 20, 1979, abandoned. This application Feb. 9, 1981, Ser. No. 232,797

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853337

Int. Cl.[4] C07C *143/24*

U.S. Cl. 260—505 C 4 Claims

1. A process for the preparation of sulfonation products of naphthalene by reacting naphthalene with SO_3 in the presence of methylene chloride, wherein naphthalene and SO_3 are brought together in the methylene chloride at temperatures of $-40°$ to $+10°$ C., in such a way that the ratio of SO_3 to naphthalene during the mixing is in the range of 3 to 5 mol SO_3 per mol naphthalene.

4,600,543

METHOD OF PREPARING ORGANIC AMMONIUM DIALKYL PHOSPHORODITHIOATES

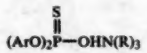
Robert F. Bridger, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 21, 1984, Ser. No. 642,928

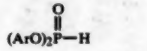
Int. Cl.[4] C07F *9/18*

U.S. Cl. 558—133 14 Claims

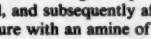
1. A process for preparing a compound of the formula



wherein Ar is an aromatic group or an aliphatic-substituted aromatic group containing 6 to 20 carbon atoms and R is hydrogen or a Cto C_{20} hydrocarbyl group, at least one of the R groups being hydrocarbyl, said process comprising the steps of first mixing a diarylphosphonate of the formula



wherein Ar is as defined herein, with elemental sulfur or a sulfur-containing compound capable of forming the P=S bond, and subsequently after said step of mixing, reacting the mixture with an amine of the formula



wherein R is as defined herein.

4,600,544

PACKING UNIT AND METHOD OF MAKING

Thomas W. Mix, Wellesley, Mass., assignor to Merix Corporation, Wellesley, Mass.

Continuation-in-part of Ser. No. 445,201, Nov. 29, 1982, abandoned. This application Nov. 23, 1983, Ser. No. 553,949

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—79 A 18 Claims

1. A packing unit for enhancing contact between two fluids moving through said unit, comprising

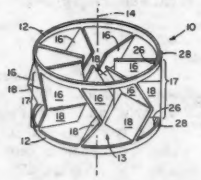
a cage, and

a set of deflectors within said cage for deflecting at least one of the fluids, said deflectors being arranged so that in any image of said unit formed by parallel rays projected onto a plane, regardless of how said unit is oriented with respect to said plane, at least half of the area enclosed by the perimeter of said image will be a shaded area, no more

than 35% of said shaded area being produced by surfaces of said deflectors and of said cage which are oriented at more than 60° to said rays.

18. A method of making a packing unit having a plurality of fluid deflectors comprising the steps of

cutting a bendable sheet to define a row of rectilinear formable areas arranged along one direction of the sheet and each connected to a supporting region comprising a strip



along said row, said strip having a supporting segment attached to at least one said formable area and a spanning segment attached to said supporting segment, and

wrapping said supporting region in said direction to define a space with said formable areas projecting into said space and wherein said wrapping step comprises folding said strip so that said supporting segment is oriented radially to a reference axis of said unit and said spanning segment is oriented tangentially with respect to said reference axis.

4,600,545

PROCESS FOR THE PREPARATION OF FIBERS FROM POLYMERIC MATERIALS

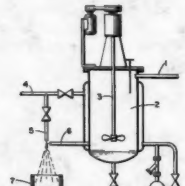
Paolo Galli, and Paolo Parrini, both of Ferrara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 847,429, Nov. 1, 1977, abandoned, which is a continuation of Ser. No. 606,453, Aug. 21, 1975, abandoned, which is a continuation of Ser. No. 335,335, Feb. 23, 1973, abandoned. This application Mar. 19, 1979, Ser. No. 22,057

Claims priority, application Italy, Feb. 25, 1972, 21055 A/72; Jan. 30, 1973, 19786 A/73; Feb. 1, 1973, 19921 A/73

Int. Cl.⁴ D21B *1/36*

U.S. Cl. 264—11 **23 Claims**



1. A process for obtaining short, elongated fibers of a polyolefinic material which are useful as produced and without prior cutting thereof, or disintegrating operations, in the manufacture of paper by conventional paper-making methods, which comprises ejecting a homogeneous, one-phase solution of from 50 to 400 grams of a polyolefinic material per liter of a solvent thereof and which is free of liquids immiscible with the solvent at a temperature at least 60° C. higher than the boiling point of the solvent and under antogenous or higher than autogenous pressure, into a zone of lower pressure in which the solution at least partially expands; and hitting the at least partially expanded solution with a jet of fluid maintained at a temperature lower than the temperature of the solution, the angle at which the jet of fluid hits the at least partially expanded solution of polyolefinic material being between 30° and 90°, the speed at which the solution of polyolefinic material is ejected into the zone of lower pressure being from 1,000 to 200,000 meters per hour, and the impact speed of the hitting fluid being from 200 to 600 meters per second.

4,600,546

PROCESS FOR THE PRODUCTION OF AN IMPLANT AS A BONE SUBSTITUTE

Hans Grundei, Lübeck, Fed. Rep. of Germany, assignor to S+G Implants GmbH, Lubeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 508,068, Jun. 24, 1983, abandoned. This application Apr. 9, 1985, Ser. No. 721,498

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1982, 3224265

Int. Cl.⁴ B29C *33/38;* C04B *33/32*

U.S. Cl. 264—59 **3 Claims**

1. In a process for production of an implant for replacing a natural bone, the process being of the type comprising using a pattern of connectively open-celled material, filling the cells of said material with a core material of ceramic matrix composition, removing the pattern material by firing the core material so that cavities remain in the core thus produced, casting the implant material into the cavities of the core, and finally removing the core material, the improvement which comprises using a pattern material having a open-celled web structure and formed as a spatial grid or lattice network, the cells of the pattern material being defined and formed by delicate interconnected threads, prior to placing the core material in the pattern material, coating the threads or walls of the cells with a wax emulsified in water at a temperature of 20°–40° C. so that the diameter of the coated threads corresponds to the diameter of cells of the natural bone replaced by the implant, applying said wax coating as an emulsion on all surfaces of the threads or walls of the cells of the pattern material, so that evaporation of the the water, by surrounding temperature, leaves the wax deposited as a dry coating on the threads or cell walls of the pattern material reinforcing and increasing the surfaces of the threads or cell walls of the pattern material, and following the filling of the cells of the pattern material with the core material, removing said coating together with the pattern material during the firing of the core material.

4,600,547

METHOD OF PREPARING POWDER INGREDIENTS BY DRY MILLING FOR SUBSEQUENT CONSOLIDATION

Elaine C. Beckwith, Riverview, and Andre Ezis, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 444,253, Sep. 30, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 630,179

Int. Cl.⁴ B28B *1/00*

U.S. Cl. 264—63 **7 Claims**

1. A method of making a compacted body useful in the fabrication of an improved, fully densified silicon nitride, ceramic body, comprising:

(a) mixing only a powder supply of silicon and oxygen carrying agents with an effective small amount of a dry lubricant having a low surface energy value less than 28 dyne/cm, and which is characterized by a glass transition temperature of −43° to −82° C. and a molecular weight greater than zero but less than 5000;

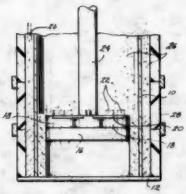
(b) dry milling said mixture for a sufficient period of time to ensure that no particle in said mixture is greater in size than 35 microns; and

(c) dry forming a compact of said dry milled mixture with pressure sufficient to provide a green density for handling.

4,600,548
METHOD OF FORMING THE PRIMARY CORE OF A PRESTRESSED CONCRETE PIPE

Vito Nenna, Pittstown, N.J., assignor to Vinen Corp., Clinton, N.J.

Filed Jan. 10, 1983, Ser. No. 457,009
Int. Cl.[4] B28B *1/10*; B29C *39/12*
U.S. Cl. 264—71 1 Claim



1. A method of forming an adherent concrete lining on the inside surface of a cylindrical metal pipe and an adherent concrete casing about the outside surface of the metal sleeve comprising the steps of:

(a) positioning a cylindrical metal sleeve having a predetermined height in substantially vertical and coaxial relationship within a cylindrical mold having substantially the same height as the metal sleeve such that the outer surface of the metal sleeve is spaced from the inner surface of the mold;

(b) supplying concrete to the space between the outer surface of the metal sleeve and the inner surface of the mold while vibrating the mold to compress the concrete therebetween to form an adherent concrete casing about the outer surface of the metal sleeve;

(c) simultaneously with step (b), supplying concrete to the interior of the metal sleeve;

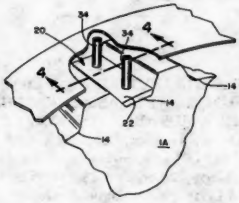
(d) simultaneously with step (b), radially compressing the concrete in the metal sleeve against the inner surface thereof to form a concrete lining along the length of the inner surface of the metal sleeve; and

(e) removing the metal sleeve having the inner concrete lining and the outer concrete casing from the mold.

4,600,549
METHOD AND DEVICE FOR PRODUCING ENDLESS SYNCHRONOUS BELT WITH MODIFED TEETH

Gregory J. Rajala, Winnebago County, and Robert J. Shavlik, Brown County, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 23, 1984, Ser. No. 603,003
Int. Cl.[4] B29C *45/14, 45/36*
U.S. Cl. 264—154 14 Claims



1. A method for producing a toothed synchronous belt comprising the steps of:

providing a closed molding chamber with connected alternate land portions and groove portions wherein the groove portions of the molding chamber form the teeth of the toothed synchronous belt;

providing selected groove portions with a groove plate assembly comprising at least one structure-forming sleeve wherein at least one structure will be formed in the corresponding tooth of the synchronous belt wherein the structure will accept at least one mounting hardware fastener; and

injecting material into the closed molding chamber.

8. An apparatus for producing a toothed synchronous belt comprising:

a closed molding chamber with connected alternate land portions and groove portions wherein the groove portions of the molding chamber form the teeth of the toothed synchronous belt;

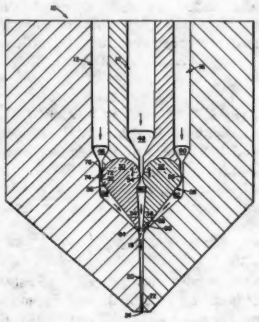
multiple groove plate assemblies, one each disposed in selected said groove portions of the molding chamber, comprising at least one structure-forming sleeve wherein at least one structure will be formed in the corresponding tooth of the synchronous belt wherein the structure will accept at least one mounting hardware fastener; and

means for injecting material into said closed molding chamber.

4,600,550
COEXTRUSION PROCESS FOR OVERCOMING THE CURTAINING EFFECT

Peter Clören, 2206 N. 16th St., Orange, Tex. 77630

Division of Ser. No. 604,995, Apr. 27, 1984, Pat. No. 4,533,308, which is a continuation-in-part of Ser. No. 600,961, Apr. 16, 1984, abandoned. This application Jan. 22, 1985, Ser. No. 693,102
Int. Cl.[4] B29C *47/14*
U.S. Cl. 264—171 8 Claims



1. A process for extruding thermoplastic materials, said process comprising the steps of

(a) passing a molten thermoplastic stream that is flowing at a relatively greater pressure at a side-to-side midpoint than at the sides thereof, through a multimanifold die restriction channel of increasing cross-sectional area from the center thereof to each end thereof, so that the molten stream is subjected to an inverse resistance to flow and thereby caused to flow at substantially equal pressure from side to side;

(b) while maintaining said substantially equal pressure, expanding the cross-sectional thickness of the molten stream;

(c) while continuing to maintain said substantially equal pressure, reducing the cross-sectional thickness of the expanded stream;

(d) converging the thickness-reduced molten stream with at least one other thickness-reduced stream that is flowing at substantially equal pressure from side to side, to form a melt-laminate; and

(e) maintaining said substantially equal flow pressure for

each stream of said melt-laminate, until said melt-laminate exits from said multimanifold die

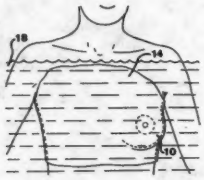
whereby the curtaining effect is minimized or eliminated in said melt-laminate.

4,600,551

METHOD FOR PRODUCING BREAST PROSTHESES AND SUPPORTS

Robert A. Erb, Jug Hollow Rd., P.O. Box 86, Valley Forge, Pa. 19481

Filed May 21, 1984, Ser. No. 612,618
Int. Cl.[4] B29C *41/12*
U.S. Cl. 264—222 25 Claims



1. A method for replicating a breast comprising the steps of:

applying a molding material to the breast to form a coating which upon hardening will be a mold of the breast;

immersing the coated breast in a liquid having essentially the same density as that of the coated breast to present the breast to an essentially zero-gravity condition while said molding material coating cures to form a hardened mold of the breast under a zero-gravity condition;

removing the hardened mold from the breast; and

forming a casting of the breast in said hardened mold.

4,600,552

STRIPPING AIDS FOR CELLULOSE ESTER FILM

Francis J. Sels, Kontich; Josephus F. Paulussen, Schilde, and Robert J. Pollet, Vremde, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Mar. 21, 1985, Ser. No. 714,199
Claims priority, application European Pat. Off., Apr. 4, 1984, 84200481.4
Int. Cl.[4] B28B *1/14;* B29C *39/00;* C08L *1/08*
U.S. Cl. 264—300 11 Claims

1. A composition comprising a cellulose ester, at least one solvent, and at least one phosphate as stripping aid, said composition comprising a mono- or di-C_{12}–C_{20}alkyl phosphate, the non-esterfied hydroxyl group(s) of which is (are) in the free acid form.

4,600,553

REACTOR CAVITY

Leonard R. Katz, Leicester, England, and Walter E. Desmarchais, Mississauga, Canada, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 1, 1983, Ser. No. 462,851
Int. Cl.[4] G21C *9/00*
U.S. Cl. 376—292 3 Claims

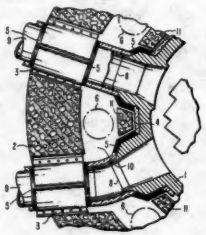
1. A nuclear reactor comprising:

a reactor vessel having a plurality of nozzles, a thick concreate primary shield surrounding said reactor vessel, a reactor cavity comprising a small spacing provided between said reactor vessel and said concrete primary shield;

a plurality of passages traversing said concrete primary shield, and a plurality of liquid-coolant-carrying pipes positioned within said passages in said concrete primary shield, and said liquid-coolant-carrying pipes welded to said nozzles of said reactor vessel, said passages in said concrete primary shield having an oblong configuration, and motion-limiting keys provided within each of said passages to limit motion of said liquid-coolant-carrying pipes therein;

said liquid-coolant-carrying pipes each having a carbon steel nozzle portion welded under shop conditions to a stainless steel ring portion in order to preclude the necessity of performing bimetallic welds in the field when joining said liquid-coolant-carrying pipes to said nozzles of said reactor vessel, and said bimetallic welds constituting a location for possible pipe rupture and a resulting loss of coolant fluid;

an inservice annular-conformed inspection space provided in said concrete primary shield at the elevation of said carbon steel nozzle portions of said liquid-coolant-carrying pipes and surrounding said bimetallic welds to permit inservice inspection of said bimetallic welds, and large open inspection ports extending from the top of said primary concrete shield and opening into said annular-conformed inservice inspection space intermediate said liquid-coolant-carrying pipes;



a relatively thick concrete radial shield wall positioned about the upper portion of said reactor vessel to protect inspection personnel, and a small spacing between said concrete radial shield wall and the upper portion of said reactor vessel forming an upper portion of said reactor cavity;

a non-crushable insulation layer carried over that portion of said liquid-coolant-carrying pipes which traverse said passages in said concrete primary shield, a non-crushable insulation layer also carried over said nozzle portions of said reactor vessel to which said pipes are welded and forming a close spacing with said radial shield wall; and

in the event of failure of one of said bimetallic welds, the resulting flow of escaping coolant is primarily directed upwardly through said inspection ports and also through said oblong passages provided through said concrete primary shield through which said liquid-coolant-carrying pipes pass to minimize any substantial pressure surges within said reactor cavity.

4,600,554

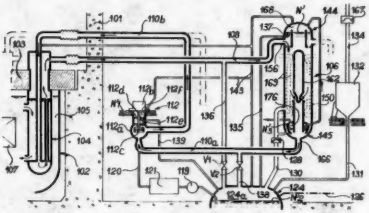
SECONDARY HEAT TRANSFER CIRCUIT FOR A NUCLEAR REACTOR COOLED BY A LIQUID METAL SUCH AS SODIUM, AS WELL AS A STEAM GENERATOR PARTICULARLY SUITABLE FOR SUCH A CIRCUIT

Alain Brachet, Orsay; Jacques Figuet, Aix en Provence; Joël Guidez, Connaux; Noël Lions, Manosque; René Traiteur, Ris Orangis, and Thierry Zuber, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Novatome, Le Plessis Robinson, both of, France

Filed Sep. 21, 1983, Ser. No. 534,284
Claims priority, application France, Sep. 22, 1982, 82 15959
Int. Cl.[4] G21C *1/02*
U.S. Cl. 376—307 11 Claims

1. A secondary heat transfer circuit for a liquid metal-cooled nuclear reactor, comprising at least one heat exchanger located in the reactor vessel, a vertical steam generator outside said

vessel, an outgoing pipe connecting an outlet tube of each heat exchanger to at least one intake tube of the steam generator, a return pipe connecting at least one outlet tube of the steam generator to an inlet tube of each heat exchanger, a pump for circulating a secondary liquid metal contained in said circuit and positioned in the return pipe, an upstream buffer tank and a downstream buffer tank disposed in said circuit respectively upstream and downstream of the exchange area of the steam generator, and a storage tank for the secondary liquid metal which can be linked with the remainder of the circuit, the steam generator having an outer envelope within which is arranged the upstream buffer tank, the latter defining a first free liquid metal level surmounted by a first neutral gas pocket above the exchange zone in the upper part of the envelope,



wherein the downstream buffer tank is also arranged inside the outer envelope and defines a second free metal level surmounted by a second neutral gas pocket, said downstream buffer tank having an annular configuration and being positioned below the exchange zone, around an outlet zone from the generator by which the secondary liquid metal flows downwards between the exchange zone and the outlet tube of the steam generator, the downstream buffer tank communicating with said outlet zone, means being provided to establish a first neutral gas pressure above the secondary free liquid metal level in the downstream buffer tank, and means being provided for establishing a second neutral gas pressure, below the first neutral gas pressure, in simultaneous manner in the storage tank and in the upstream buffer tank.

4,600,555

METHOD OF PRODUCING A CYLINDRICAL PERMANENT MAGNET

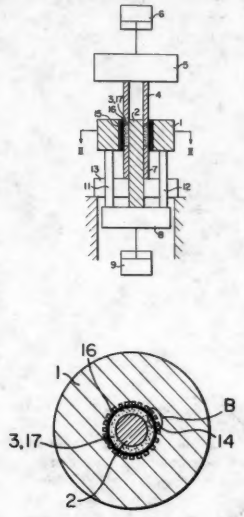
Motoharu Shimizu, Kumagaya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,499
Claims priority, application Japan, May 20, 1983, 58-88962
Int. Cl.[4] B22F *3/16, 3/24*
U.S. Cl. 419—5 **8 Claims**

1. A method of producing a cylindrical permanent magnet comprising the steps of; preparing a metal mold cooperating with a lower punch in defining therein a cylindrical compacting cavity, said metal mold being provided in the inner peripheral surface thereof with a magnetic field means corresponding to the magnetic poles of the magnet to be produced; charging said compacting cavity with a ferromagnetic powder having magnetic anisotropy; energizing said magnetic field means to impart magnetic anisotropy to said ferromagnetic powder while compacting said powder between an upper punch and said lower punch to form a compact; demagnetizing the formed compact followed by a firing; and magnetizing the fired compact in the same direction as the imparted anisotropy; characterized in that said magnetic field means produce a pulsed magnetic field of an intensity not smaller than 3.5×10^3 ampere-turn/meter as measured at the outer peripheral surface of said compacting cavity, thereby attaining a multipole surface anisotropy on said compact.

3. A method of producing a cylindrical permanent magnet according to claim 1, wherein a ring-shaped spacer made of a non-magnetic material is fitted on the inner surface of said metal mold wherein the thickness t of said ring-shaped spacer is selected to meet the following condition:

$$t>\pi\cdot d/3\cdot M$$



where, d represents the inside diameter of said spacer, while M represents the number of the poles.

4,600,556

DISPERSION STRENGTHENED MECHANICALLY ALLOYED AL-MG-LI

Stephen J. Donachie, New Windsor, and Paul S. Gilman, Sutfern, both of N.Y., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Aug. 8, 1983, Ser. No. 521,060
Int. Cl.[4] C22C *21/00*
U.S. Cl. 420—542 **30 Claims**

30. A mechanically alloyed dispersion strengthened aluminum-base alloy consisting essentially of about 1.5% to about 2.5% lithium, about 2% up to about 4.5% magnesium, about 0.7% up to about 1.2% carbon, a small but effective amount for increased stability up to about 1% oxygen, said carbon level exceeding the oxygen level and said alloy having in the solution treated condition a YS of at least 414 MPa, elongation of at least about 7%, and fracture toughness (K_Q) at 22 mm B of at least about 16.5 MPa $\sqrt{m}$.

4,600,557

SYSTEM FOR DEODORIZING AND DECONTAMINATING AUTOPSY ROOMS

Werner U. Spitz, 50 Stonehurst, Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 499,363, May 31, 1983, abandoned. This application Mar. 15, 1985, Ser. No. 712,220
Int. Cl.[4] A61L *9/00*
U.S. Cl. 422—4 **8 Claims**

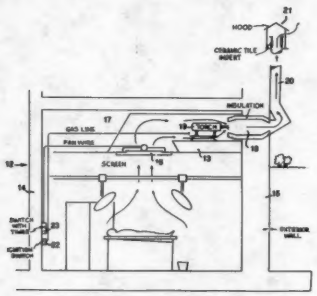
1. A method for deodorizing and decontaminating autopsy rooms wherein autopsies are conducted on decomposing human remains comprising:

initiating withdrawal of large volumes of air and noxious

gases substantially instantaneously from an autopsy room in a building prior to performing an autopsy;

directing the large volume of air and noxious gases from said autopsy room to a chamber;

subjecting the air and noxious gases withdrawn from said autopsy room to sufficient temperature within said chamber to thereby ignite, burn and deodorize flammable gases;



directing the air and burned gases to the exterior of said building;

performing an autopsy within said autopsy room while continuing the withdrawal of air and noxious gases from said autopsy room; and

continuing the withdrawal of air and noxious gases from said autopsy room for a period of time after the completion of said autopsy.

4,600,558

METHOD AND COMPOSITION FOR CORROSION INHIBITION OF CARBON STEEL BY AMMONIUM SULFATE

Joseph Novotny, Baton Rouge, La., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 164,486, Jun. 30, 1980. This application Nov. 15, 1984, Ser. No. 671,722

Int. Cl.⁴ C23F *11/00*

U.S. Cl. 422—7 **6 Claims**

1. A process for inhibiting carbon steel corrosion by an aqueous ammonium sulfate fertilizer solution in contact with carbon steel comprising adding to said solution a member selected from the group consisting of ammonium polyphosphate, sodium nitrite, potassium nitrite, ammonium thiosulfate, sodium thiosulfate and potassium thiosulfate in an amount effective to substantially inhibit corrosion of said carbon steel in contact with said solution.

4,600,559

VACUUM EXTRACTOR WITH CRYOGENIC CONCENTRATION AND CAPILLARY INTERFACE

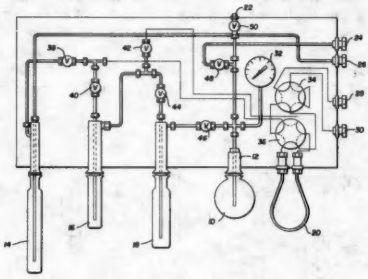
Michael H. Hiatt, Las Vegas, Nev., assignor to The United States of America as represented by the Administrator Environmental Protection Agency, Washington, D.C.

Filed Mar. 26, 1982, Ser. No. 362,379

Int. Cl.⁴ G01H *30/02*

U.S. Cl. 422—89 **6 Claims**

1. An apparatus including a vacuum distillation extractor in combination with a cryogenic concentrator which is interfaced by capillary column means to a physico-chemical analytical device for qualitatively and/or quantitatively analyzing volatile or purgeable substances contained in environmental sample matrices, said apparatus comprising a sample chamber provided with an outlet containing said environmental sample, a leak detecting inert gas inlet port, a vacuum pump connected to a vacuum inlet port, a precooling trap, cryogenic concentration trap and cryogenic focusing trap, each of said traps being selectively interconnected with one another and with said leak detecting inert gas inlet port, said vacuum port and said sample chamber outlet by means of a plurality of conduit transfer lines, fluid passage through said transfer lines being controlled by means of a series of selectively actuated valves positioned at various points in said transfer lines, a 6-port valve controlled carrier gas inlet line and a 6-port valve controlled carrier gas



and volatile extract outlet line in selective fluid communication with the outlet port from said cryogenic focusing trap, means to selectively heat each of said traps, and capillary column means interfacing gas chromatograph means for analytically determining the composition and concentration of sample pollutants in the volatile extract emanating from the heated cryogen focusing trap.

4,600,560

PROCESS FOR THERMAL INSULATION OF THE SURFACE OF A MOLTEN MASS OF STEEL AND THERMALLY INSULATING BOARD USED AS A COVER PLATE FOR CARRYING OUT SAID PROCESS

Hannes Vallak, Geneva, Switzerland, assignor to International Ferrox Co., Establishment, Vaduz, Liechtenstein

PCT No. PCT/EP84/00063, § 371 Date Nov. 7, 1984, § 102(e) Date Nov. 7, 1984, PCT Pub. No. WO84/03460, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 6, 1984, Ser. No. 672,251

Claims priority, application Sweden, Mar. 8, 1983, 8301244

Int. Cl.⁴ B01J *11/18*; B22D *7/10*

U.S. Cl. 422—41 **1 Claim**

1. A process of thermally insulating a surface of a molten mass of steel which is contained in a foundry ladle or a tundish, comprising: placing a thermally insulating board on the surface of the molten mass of steel, in direct contact with the surface thereof, so as to cover the surface, said board being made of a homogeneous mixture of expanded perlite particles and at least one fiber selected from the group consisting of cellulosic, mineral and ceramic fibers, said particles and said fibers being bonded together by at least one fire proof binder.

4,600,561

METHOD AND DEVICE FOR SEPARATING HARMFUL SUBSTANCES FROM A FLUE GAS

Willi Frei, St. Gallen, Switzerland, assignor to Air Frohlich Ag für Energierückgewinnung, Arbon, Switzerland

Filed Dec. 20, 1984, Ser. No. 684,068

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1983, 3346865

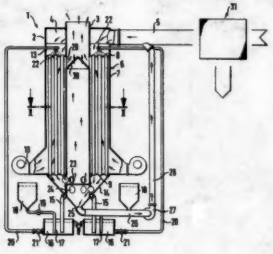
Int. Cl.⁴ B01D *50/00*

U.S. Cl. 422—170 **22 Claims**

1. Method for the separation of a harmful substance from a flue gas, and especially from sulfur oxide containing combustion gas, in which

(a) in a single absorption heat exchanger arrangement cooling and washing the flue gas is carried out simultaneously, with the flue gas being cooled below the dew point;

(b) said cooling is carried out by external air in counter flow to the flue gas flow;
(c) the flue gas is divided in its passage through the absorption heat exchanger arrangement into at least two parallel partial flows, of which the first flow is conducted through a first treatment zone and the second flow is conducted through a second treatment zone;
(d) in the first treatment zone a first absorption liquid is



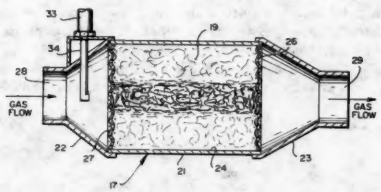
introduced into the flue gas to effect extensive removal of said harmful substance from the flue gas while in the second treatment zone a second absorption liquid is introduced into the flue gas, precipitated harmful substance being soluble in said second absorption liquid;
(e) the two treatment zones are cyclically exchanged; and
(f) condensate obtained from the flue gas and the absorption liquid are guided in unidirectional flow through said heat exchanger.

4,600,562

METHOD AND APPARATUS FOR FILTERING ENGINE EXHAUST GAS

Kashmir S. Virk, Hopewell Junction; Michael A. Caggiano, Chelsea, and Roger L. Leisenring, Jr., Hopewell Junction, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 24, 1984, Ser. No. 686,163
Int. Cl.[4] F01N *3/10*
U.S. Cl. 422—180 **10 Claims**



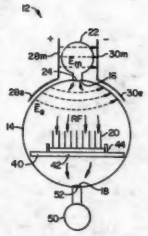
1. A filter for treating a stream of hot exhaust gas which carries an amount of combustible particulate matter from an internal combustion engine, and which filter includes means to incinerate the said particulate matter into gaseous state prior to discharge of the treated exhaust gas into the atmosphere, which filter further includes;
an elongated casing which defines a reaction chamber having an inlet communicated with a source of said hot exhaust gas, and a casing outlet,
a composite, elongated cylindrical filter bed positioned in said reaction chamber defining varying sized particulate retaining passages through which said hot exhaust gas flows,
said composite filter bed comprising a unitary body formed of randomly disposed metallic fibers which are compacted into a compressibly resilient fibrous mass to form said varying sized particulate retaining passages through the mass,
said fibrous mass including a plurality of concentrically arranged discrete segments, at least one segment of which is characterized by a metallic fiber density greater than the metallic fiber density of other discrete segments in the mass,
whereby the flow pattern of hot exhaust gas flowing through the filter bed will be influenced to follow a path of least resistance through said other discrete segments, and to direct hot gas in an outwardly direction toward the casing, prior to passing through the casing outlet.

4,600,563

PLASMA REACTOR WITH VOLTAGE TRANSFORMER

Perry Diederich, Fremont, Calif., assignor to Psi Star Incorporated, Hayward, Calif.

Filed Feb. 5, 1985, Ser. No. 698,448
Int. Cl.[4] B01J *19/08, 19/12*
U.S. Cl. 422—186.29 **4 Claims**



1. In a plasma reactor comprising
a working chamber which is adapted to receive at least one article and a volume of plasma which is capable of interacting with a material of said article;
a pair of electrodes positioned about said chamber; and,
a radio-frequency generator,
wherein the improvement comprises a radio frequency voltage transformer which includes a primary winding connected to the radio-frequency generator through an impedance matching network and a secondary winding, the center of which is grounded, and which secondary winding is adapted to transform the energy received from the primary winding into plasma-exciting energy at the electrodes, whereby the voltage between the energy-excited plasma and any grounded members of the plasma reactor is about 50 volts such that the intensity of any arc discharge across said voltage is minimized.

4,600,564

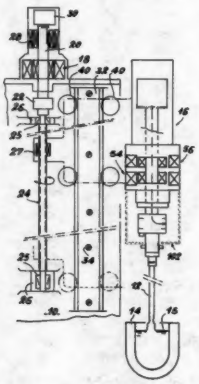
MACHINE FOR PULLING MONOCRYSTALS

Francois Lissalde, Seyssinet; Pierre Bathelet, Brignoud; Bruno Ferrieu, Seyssinet, and Michel Brochier, Haute Jarrie, all of France, assignors to Crismatec, Gieres, France

Filed Sep. 4, 1984, Ser. No. 647,178
Claims priority, application France, Sep. 6, 1983, 83 14219
Int. Cl.[4] B01D *9/00*
U.S. Cl. 422—249 **9 Claims**

1. A machine for pulling Czochralski monocrystals from a bath of molten product contained in a crucible and kept at a temperature above the melting point of the product by appropriate heating means, a monocrystalline nucleus of said product being placed at the lower end of a pulling spindle having a vertical axis, said machine comprising a fixed frame; a carriage which is supported by said frame and movable with respect to said frame in a direction parallel to the axis of said pulling

spindle and means for guidance of the carriage with respect to said frame; first control means for moving said carriage in said direction in at least two different speeds, said carriage rotatably supporting said pulling spindle about the axis of the latter; and second control means for rotating said pulling spindle about the vertical axis of said pulling spindle; said first control means comprising a single torque motor which is controlled in position and speed, said motor being mounted on said frame and directly connected to a screw, said screw being received in a nut mounted on said carriage, second control means comprising a second speed controlled torque motor mounted on said carriage and directly connected to said pulling spindle, said pulling spindle being in two separate parts, fixedly connected therebetween by a weight transducer and rotatably mounted therewith supplying electrical signals transmitted to a first electronic processing circuit fixed to said pulling spindle; said first electronic processing circuit supplying electrical signals, which are transmitted to a second electronic processing circuit, which is independent of said pulling spindle, by an electro-optical system positioned along the axis of said spindle between said first electronic processing circuit and said carriage; further comprising an electric power supply for said first electronic processing circuit, which is independent of said pulling spindle, and a transformer positioned between said carriage and said pulling spindle through which said power supply is electrically connected in contactless manner to said first electronic processing circuit; and means for supplying control instructions to said first processing circuit independent of said pulling spindle, and capacitive coupling means positioned between said carriage and said pulling spindle and electrically connected in contactless manner with, said means for supplying control instructions to said first electronic processing circuit and wherein said weight transducer comprises an outer part integral with a first portion of said pulling spindle and centered along the axis of the latter via centering means, and an inner part integral with a second portion of said pulling spindle and centered along the axis thereof by second centering means, and means for measuring the relative displacement between said two parts along the axis of said spindle.



4,600,565

PROCESS FOR MAKING MANGANESE (II) SALT SOLUTIONS CONTAINING AMMONIUM SALT

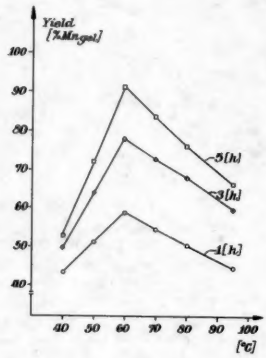
Klaus Lehr; Bernhard Hofmann, both of Hürth, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 708,299

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1984, 3408031

Int. Cl.[4] C01G *45/00*

U.S. Cl. 423—50 **10 Claims**



1. A process for making an ammonium salt-containing manganese(II)salt solution which comprises: leaching a reduced manganese ore containing more than 55 wgt % manganese(II)oxide with a solution containing 0.5 to 2.5 mol/l diammonium sulfate or with a solution containing 1.0 to 5.0 mol/l ammonium nitrate at a temperature of 57° to 68° C. under reduced pressure, the temperature of 57° to 68° C. which is the boiling temperature of the leaching liquor, being adjusted through reduced pressure.

4,600,566

METHOD OF LITHIUM ISOTOPE SEPARATION

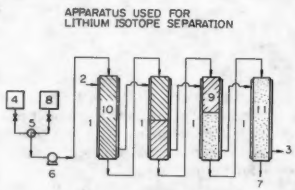
Sachio Fujine; Keiichiro Saito, and Koreyuki Shiba, all of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,981

Claims priority, application Japan, Feb. 8, 1983, 58-19259

Int. Cl.[4] C01D *15/00*

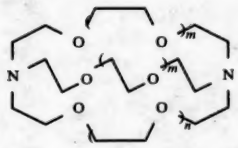
U.S. Cl. 423—179.5 **14 Claims**



1. A method of separating lithium-6 from lithium-7 in a displacement chromatography process which comprises passing a lithium salt methanol solution into a cryptand resin packed column so as to adsorb a predetermined amount of lithium ions on the resin thereby creating a lithium adsorbed band of given length, and subsequently passing through the column a solution of ion species having a higher complex

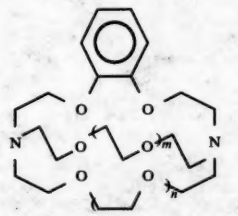
stability constant than the lithium ion to displace the lithium adsorbed band without substantially changing its length, thereby obtaining a rate of separation of 1.03–1.06, the resin containing cryptand groups having the following structural formula (I) or (II)

(I)



(i) m=n=0; [1,1,1]-cryptand; 4,10,15-trioxa-1,7-diazabicyclo[5,5,5]heptadecane(IUPAC)
(ii) m=0, n=1; [2,1,1]-cryptand; 4,7,13,18-tetraoxa-1,10-diazabicyclo[8,5,5]eicosane(IUPAC)
(iii) m=1, n=0; [2,2,1]-cryptand; 4,7,13,16,21-pentoaxa-1,10-diazabicyclo[8,8,5]tricosane(IUPAC)
(iv) m=n=1; [2,2,2]-cryptand; 4,7,13,16,21,24-hexaoxa-1,10diazabicyclo[8,8,8]hexacosane(IUPAC)
(v) m=1, n=2; [3,2,2]-cryptand; 4,7,10,16,19,24,27-heptaoxa-1,13-Δdiazabicyclo[11,8,8]nonacosane(IUPAC)

(II)



(i) m=n=1; [2B,2,2]-cryptand; 4,13-(ethanoxyethanoxyethano)-4H,13H-1,7,10,16,4,13-benzotetraoxadiazabicyclootaΔdecine-2,3,5,6,8,9,11,12,14,15-decahydro(IUPAC)
(ii) m=n=0; [2B,1,1]-cryptand;
(iii) m=0, n=1; [2B,2,1]-cryptand.

4,600,567

SULFUR OXIDES SCRUBBING PROCESS

Perry E. Reeder, Valley Center, Kans., assignor to Koch Refining Company, Wichita, Kans.

Filed Jan. 11, 1985, Ser. No. 690,640
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—242 **18 Claims**

1. A process for removing sulfur oxides and solid particulates from a gaseous effluent, the steps of said process comprising:

contacting within a venturi structure a gaseous effluent containing sulfur oxides with a liquid scrubbing mixture;

passing the admixture of said gaseous effluent and liquid scrubbing mixture through a constricted passage of said venturi structure to increase the velocity thereof;

separating the admixture into a liquid portion and a gas portion;

delivering said gas portion of said separation step to a packed tower beneath the packed section thereof;

contacting said gas portion with liquid scrubbing mixture in the packed section of said tower to form a gaseous overhead effluent substantially free of sulfur oxides and a bottoms liquid;

combining said bottom liquid from said packed section of said tower with said liquid portion from said separating step to form a combined liquid bottoms;

adjusting the pH of said combined liquid bottoms with a basic solution to form a liquid scrubbing mixture, said basic solution selected from the group consisting of alkali metal hydroxides, ammonium hydroxide, and ammonia; and

dividing said liquid scrubbing mixture into a tower bottoms products, a first recycle stream providing said liquid scrubbing mixture to said first contacting step, and a second recycle stream providing said liquid scrubbing mixture to said second contacting step.

4,600,568

FLUE GAS DESULFURIZATION PROCESS

Heeyoung Yoon, McMurray, and Robert M. Statnick, Pittsburgh, both of Pa., assignors to Conoco Inc., Wilmington, Del.

Filed Mar. 22, 1985, Ser. No. 714,742
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] C01B *17/00*; B01J *8/00*
U.S. Cl. 423—242 **4 Claims**

1. The method for reducing sulfur dioxide content of a flue gas resulting from combustion of a sulfur-containing fuel, which method comprises:

(a) mixing into said flue gas, at a point where its temperature is between about 120° and about 230° C., a finely divided dry sorbent comprising alkaline earth metal oxide or hydroxide in amount sufficient to provide a metal salt: sulfur ratio of at least about 0.5, said alkaline earth metal being selected from calcium and magnesium;

(b) spraying into the resulting suspension of sorbent in flue gas an aqueous solution of solubilizing agent, such agent being selected from sodium hydroxide, sodium carbonate, calcium chloride, adipic acid and glycerol;

(c) providing a contact time between said sorbent in flue gas and droplets resulting from said spraying of at least about 1 second;

(d) subsequently separating from said flue gas solids comprising sorbent and solids resulting from combustion of said fuel;

(e) discharging from said separating a flue gas of substantially diminished sulfur dioxide content; and

(f) regulating the rate of said spraying relative to the rate of said flue gas such that the temperature of said flue gas at the point of said separating is between about 10° C. and about 35° C. above its saturation temperature.

4,600,569

FLUE GAS DESULFURIZATION PROCESS

Heeyoung Yoon, McMurray, Pa., assignor to Conoco Inc., Wilmington, Del.

Filed Mar. 22, 1985, Ser. No. 714,741
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—243 **3 Claims**

1. The method for reducing sulfur dioxide content of a flue gas resulting from combustion of a sulfur-containing fuel, which method comprises:

(a) spraying into said flue gas, at a point where its temperature is between about 120° and about 230° C., an aqueous solution of a calcium salt of a low molecular weight carboxylic acid, said acid being selected from formic and acetic;

(b) providing a contact time between said flue gas and droplets resulting from said spraying of at least about 1 second;

(c) subsequently separating from said flue gas solids resulting from drying of said droplets and solids resulting from combustion of said fuel;

(d) discharging from said separating a flue gas of substantially diminished sulfur dioxide content; and

(e) regulating the rate of said spraying relative to the rate of said flue gas such that the temperature of said flue gas at the point of said separating is at least about 10° C. above its saturation temperature.

4,600,570

CONTINUOUS CONTROLLED PROCESS FOR REMOVING SULPHUR OXIDES GASES FROM STACK GASES

Ping-Wha Lin, 506 S. Darling St., Angola, Ind. 46703

Filed Jun. 10, 1985, Ser. No. 743,032
Int. Cl.[4] B01J 8/00; C01B 17/00
U.S. Cl. 423—244 24 Claims

1. A process for effecting the continuous efficient desulphurization of gases containing sulphur oxides, comprising the steps of:

passing a flow of flue gas containing sulphur oxides gases through heat exchanging means to change the temperature thereof,

transmitting the heated flue gas through preheating means in order to further increase the temperature thereof,

passing the further heated flue gas through catalytic converter means in order to convert the sulphur dioxide therein to sulphur trioxide and resulting in a sulphur trioxide rich flue gas,

communicating the sulphur trioxide rich flue gas to said heat exchanging means in order to heat the incoming flue gas and cool the sulphur trioxide rich flue gas,

transmitting the sulphur trioxide rich flue gas to a reactor and providing a calcium containing reactant to the reactor,

withdrawing the reaction product of the reactant and sulphur oxides,

quenching said reaction product to effect a porous core of unreacted reactant in an outer shell of cracked calcium sulphate,

resupplying the quenched reaction product to the reactor for additional reaction with sulphur oxides within the core region of the reaction product,

continuously emitting a desulphurized exit gas from said reactor to said heat exchanging means in order to effect the change in temperature of said incoming flue gas, and

transmitting said desulphurized exit gas to an exit.

4,600,571

CATALYSTS AND THEIR USE IN AMMONIA PRODUCTION

John J. McCarroll, Camberley; Stephen R. Tennison, and Nicholas P. Wilkinson, both of Weybridge, all of England, assignors to The British Petroleum Company p.l.c., Sunbury-on-Thames, United Kingdom

Filed Mar. 7, 1984, Ser. No. 586,976
Claims priority, application United Kingdom, Apr. 18, 1983, 8307612
Int. Cl.[3] C01C 1/04
U.S. Cl. 423—363 3 Claims

1. A process for the production of ammonia which comprises passing a gaseous mixture of nitrogen and hyorogen under ammonia synthesis conditions over a catalyst prepared by inpregnating a carbon support with a solution of a halogen-containing compound of ruthenium, reducing the ruthenium compound to the metal with hydrogen, and then depositing a promoting water stable compound of an alkali metal and a promoting water stable compound of barium on the carbon.

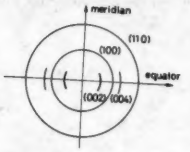
4,600,572

ULTRAHIGH STRENGTH CARBON FIBERS

Tohru Hiramatsu, Matsuyama; Yohji Matsuhisa, and Tomitake Higuchi, both of Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 20, 1985, Ser. No. 746,687
Claims priority, application Japan, Jun. 22, 1984, 59-127389; Jun. 22, 1984, 59-127390
Int. Cl.[4] D01C 5/00; D01F 9/12, 9/22
U.S. Cl. 423—447.2 10 Claims

1. An ultrahigh strength carbon fiber having a surface layer having a crystalline completeness which is susbstantially the same as or higher than that of the central region thereof and a functional group amount ratio (O_{ls}/C_{ls}) of 0.1 to 0.4 as detected in the fiber surface by X-ray photoelectron spectroscopy and a



resin-impregnated strand strength of at least about 600 kg/mm^2.

4,600,573

COMPOSITIONS AND METHOD FOR ALLEVIATING THE TOXIC EFFECTS OF 1,3-BIS(2-CHLOROETHYL)-1-NITROSOUREA

Tai-Shun Lin, North Haven, and William H. Prusoff, Branford, both of Conn., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 458,334, Jan. 17, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,397
Int. Cl.[4] A61K 31/70
U.S. Cl. 424—10 2 Claims

1. A pharmaceutical composition in dosage unit form comprising 1,3-bis(2-chloroethyl)-1-nitrosourea and thymidine in such concentration ratios as to provide dosage units containing from about 10 to 20 mg/kg of body weight of 1,3-bis(2-chloroethyl)-1-nitrosourea and about 2 g/kg of body weight of thymidine in association with a pharmaceutically acceptable carrier.

4,600,574

METHOD OF PRODUCING A TISSUE ADHESIVE

Adolf Lindner, and Yendra Linnau, both of Vienna, Austria, assignors to Immuno Aktiengeselischaft fur Chemisch-Medizinische Produkte, Vienna, Austria

Filed Mar. 21, 1984, Ser. No. 591,784
Int. Cl.[4] A61K 9/70
U.S. Cl. 424—28 7 Claims

1. A method of producing a tissue adhesive based on polysaccharide or on human or animal proteins, said method comprising the steps of (a) impregnating a tissue-compatible flat material selected from the group consisting of collagen, gelatine and polysaccharide with a solution comprised of fibrinogen and Factor XIII, and (b) lyophilizing said impregnated flat material to obtain a coherent matrix of said tissue-compatible flat material.

4,600,575

AEROSOL ANESTHETIC COMPOSITIONS

Song-Ling Lin, and Moo-Kwang Park, both of Rouses Point, N.Y., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 18,535, Mar. 8, 1979, abandoned. This application May 14, 1981, Ser. No. 263,531
Int. Cl.[4] A61K 31/24; A61L 9/04
U.S. Cl. 424—45 5 Claims

1. A liquid anesthetic composition in an aerosol container consisting essentially of a single phase mixture of a water washable base of benzocaine in a solvent and a propellant wherein,

a. the weight percent of said benzocaine is from about 0.5% up to its maximum solubility in the solvent;

b. the solvent is selected from the group consisting of polyethylene glycol monolaurate and mixtures of about 40% to about 60% of said polyoxyethylene sorbitan trioleate having an average of 20 units of ethylene oxide in the

molecule with about 40% to about 60% of said polyethylene glycol monolaurate wherein the polyethylene glycol has an average molecular weight of about 400;

c. the propellant comprises about 45% to about 55% by weight of the composition and consists essentially of a mixture of about 35% to about 70% by weight of difluoroethane and about 30% to about 65% by weight of a hydrocarbon selected from the group consisting of n-butane, isobutane, n-propane and mixtures thereof

with the proviso that the composition remains a single phase mixture after exposure to temperatures of about −20° C. when the benzocaine comprises about 20% of said base.

4,600,576
THIOGERANYL ESTERS AND ORGANOLEPTIC USES THEREOF

Alan O. Pittet, Atlantic Highlands; Ranya Muralidhara, Fair Haven; Manfred H. Vock, Locust; Kevin P. Miller, Middletown, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

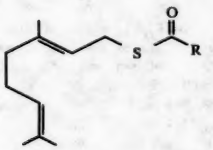
Filed Jun. 21, 1985, Ser. No. 747,425

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ C07C *153/023;* A61K *7/16, 31/265;* A23L *2/26;* 558 *250*

U.S. Cl. 424—49 **9 Claims**

1. The thiogeranyl ester having the structure:



wherein R represents C_1–C_4 alkyl or 2-(2-pentenyl).

7. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of perfume compositions, colognes, perfumed articles, foodstuffs, chewing gums, toothpastes and medicinal products comprising the step of intimately admixing with said consumable material, an aroma or taste augmenting or enhancing quantity of the thiogeranyl ester of claim 1.

4,600,577
PHARMACEUTICAL PREPARATIONS OF PINACIDAL

Erik J. Didriksen, Ballerup, Denmark, assignor to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselkab), Ballerup, Denmark

Filed Jan. 23, 1984, Ser. No. 572,754

Claims priority, application Denmark, Feb. 11, 1983, 589/83

Int. Cl.⁴ A61K *9/14, 9/54, 9/58*

U.S. Cl. 424—20 **4 Claims**

1. An improved antihypertensive composition in slow release form comprising an antihypertensive effective amount of N''-cyano-N-4-pyridyl-N'-1,2,2,trimethyl propylguanidine wherein the improvement comprises said propylguanidine being present in the form of a mixture of coated pellets, a portion thereof being:

(a) rapid release pellets wherein the coating consists essentially of a copolymer of acrylic and methacrylic ester which releases the contents of the pellet at a pH<4, said coating being present in an amount from 2–10% by weight of the pellets; and

(b) the remaining portion being coated pellets wherein the coating consists essentially of an anionic copolymer of methacrylic acid and methacrylic acid ester which releases the contents at a pH in the range of pH 5 to pH 7.5, said coating being present in an amount from 5–20% by weight of the pellets; and wherein the ratio of (a) to (b) is 1:10 to 10:1.

4,600,578
METHOD OF INHIBITING DIARRHEA

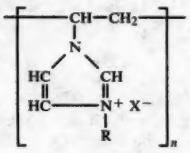
Anthony W. Pircio, Manlius; Joseph P. Buyniski, Syracuse, both of N.Y., and William T. Comer, Greenwich, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 11, 1984, Ser. No. 609,269

Int. Cl.⁴ A61K *31/74*

U.S. Cl. 424—78 **7 Claims**

1. Method for inhibiting diarrhea in mammals, said method comprising orally administering to said mammals a diarrhea inhibiting effective amount of a quaternized vinylimidazole-ethylene glycol dimethacrylate copolymer consisting of from about 1% to about 19% of ethylene glycol dimethacrylate moieties and polyvinylimidazolium moieties having the structural formula



wherein n, on average, ranges from about 25 to about 35, wherein R is alkyl having from 1 to 3 carbon atoms and wherein X^- is a pharmaceutically acceptable anion selected from the group consisting of a halide, acetate, propionate and phosphate.

4,600,579
N-ACETYL-P-AMINOPHENOL COMPOSITIONS CONTAINING PARTIALLY GELATINIZED STARCH AND METHOD FOR PREPARING SAME

Anil M. Salpekar, Creve Coeur; Steven R. Freebersyser, Florissant, and Douglas A. Robinson, Creve Coeur, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 7, 1983, Ser. No. 502,067

Int. Cl.⁴ A61K *31/16, 31/70*

U.S. Cl. 424—80 **16 Claims**

1. A method for preparing a direct tabletting, free-flowing particulate N-acetyl-p-aminophenol composition capable of being directly formed into a tablet having high hardness, short disintegration time and short dissolution time, said method comprising:

(a) forming a slurry containing components dispersed substantially uniformly throughout an aqueous medium, said components comprising:

(A) N-acetyl-p-aminophenol in an analgesic amount,

(B) a pharmaceutically acceptable partially gelatinized starch having a Percent Gelatinization of from about 50 to about 75% and in an amount effective for imparting said hardness, disintegration time and dissolution time, and

(C) a pharmaceutically acceptable lubricant in an amount at least sufficient to impart effective mold release properties to said tablet, the total of the amounts of said components being such that the slurry concentration is approximately 35–60% by weight, and

(b) spray drying said slurry under spray drying conditions such that the spray dried particles include water in an amount from about 0.5 to about 1.5% based on the total weight of the composition and such that the composition is at least substantially the same as a composition selected from the group consisting of (i) a first composition obtained when said slurry is co-currently spray dried at a slurry feed rate of about 400 kilograms per hour under the following approximate spray drying conditions: inlet temperature—300°

F.–600° F., outlet temperature—150° F.–250° F. and atomization pressure—1000–4000 psi, and (ii) a second composition obtained when said slurry is counter-currently spray dried at a slurry feed rate of about 10 kilograms per hour under the following appromximate spray drying conditions: inlet temperature—375° F.–600° F., outlet temperature—150° F.–250° F., atomization pressure—22–35 psi and slurry feed pressure—45–60 psi,

said components being distributed throughout the particles of each of said first and second composiitions such that at least a portion of said lubricant is dispersed within said last-mentioned particles and at least a portion of the lubricant is disposed on the outer surfaces of said last-mentioned particles.

4,600,580

NOVEL ENZYME DERIVATIVES

Richard A. G. Smith, Reigate Surrey, England, assignor to Beecham Group P.L.C., United Kingdom

Filed Dec. 21, 1984, Ser. No. 684,359

Claims priority, application United Kingdom, Dec. 24, 1983, 8334499

Int. Cl.[4] C12N *9/96, 11/06*

U.S. Cl. 424—94 **21 Claims**

1. A derivative of a fibrinolytic enzyme in which the catalytic site on the enzyme which is responsible for fibrinolytic activity is blocked by a human protein attached thereto by way of a reversible linking group.

4,600,581

SYNTHETIC PHEROMONES FOR THE SPINED SOLDIER BUG, *PODISUS MACULIVENTRIS*

Jeffrey R. Aldrich, College Park, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 496,687, May 20, 1983, abandoned. This application Dec. 13, 1984, Ser. No. 681,394

Int. Cl.[4] A01N *25/00*

U.S. Cl. 424—84 **6 Claims**

1. A synthetic pheromone composition for attracting the spined soldier bug, *Podisus maculiventris* consisting of an effective attractant mixture of, by volume, 53.6% (±)-α-terpineol; 43.9% (E)-2-hexenal; and 2.5% benzyl alcohol.

4,600,582

THERAPEUTIC TREATMENT

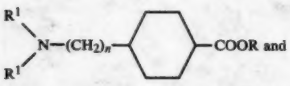
Erik Stevens, Linden-Lubbeek, and Ernestina M. Van Hoeyveld, Lubbeek, both of Belgium, assignors to Tetra Consultants, Inc., New Rochelle, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,568

Int. Cl.[4] A61K *39/36, 39/00*

U.S. Cl. 424—91 **5 Claims**

1. In a method of parenterally administering a physiologically active composition to a patient comprising inoculating a patient with a parenterally administerable composition comprised of a physiologically active substance selected from the group consisting of antibiotics, hormones, steroids, allergenic substances, allergen extracts, toxoids and anti-toxins, wherein the improvement comprises prior to the parenteral administration thereof, adding to the physiologically active composition an effective amount of a compound from the group consisting of:



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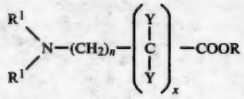


wherein R^1 is H or lower alkyl; n is an integer of from 1 to 6; x is 0 or 1; each Y is H; R is H, acyl or lower alkyl; and the non-toxic pharmaceutically acceptable salts thereof wherein the effective amount reduces local adverse reactions which occur at the site of administration.

2. The method of claim 1 wherein the compound is epsilon-aminocaproic acid.

3. The method of claim 1 wherein the compound is tranexamic acid.

4,600,583

PHARMACEUTICAL COMPOSITIONS

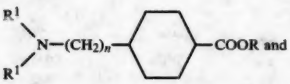
Erik Stevens, Linden-Lubbeek, and Ernestina M. Van Hoeyveld, Lubbeek, both of Belgium, assignors to Tetra Consultants Inc., New Rochelle, N.Y.

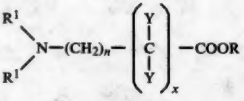
Filed Sep. 7, 1982, Ser. No. 415,569

Int. Cl.[4] A61K *39/36, 39/00*

U.S. Cl. 424—91 **10 Claims**

1. In a composition for parenteral administration comprised of physiologically active substances selected from the group consisting of antibiotics, hormones, steroids, allergenic substances, allergen extracts, toxins and antitoxins, wherein the improvement comprises having incorporated therein an effective amount of a compound selected from the group consisting of:





wherein R is H, lower alkyl or acyl; x is 0 or 1; each Y is H; R^1 is H or lower alkyl; and n is an integer of from 1 to 6; and the non-toxic pharmaceutically acceptable salts thereof, wherein the effective amount imparts storage stability.

2. The composition of claim 1 wherein the compound is epsilonaminocaproic acid.

10. In a method of preparing a compositions for parenteral administration comprised of physiologically active substances selected from the group consisting of antibiotics, hormones, steroids, allergenic substances, allergen extracts, toxins and antitoxins, wherein the improvement comprises the addition of an effective amount of tranexamic acid and the non-toxic pharmaceutically acceptable salts thereof for the purposes of storage stability.

4,600,584

PHOSPHINE PRODUCING HYDROLYZABLE METAL PHOSPHIDE AND USE THEREOF

Wolfgang F. R. Friemel, Heppenheim, and Werner O. Praxl, Rimbach, both of Fed. Rep. of Germany, assignors to Dr. Werner Freyberg Chemische Fabrik Delitia Nachf, Laudenback, Fed. Rep. of Germany

Continuation of Ser. No. 289,941, Aug. 4, 1981, abandoned, which is a continuation of Ser. No. 240,447, Mar. 4, 1981, Pat. No. 4,421,742, which is a continuation of Ser. No. 964,410, Nov. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 850,341, Nov. 10, 1977, abandoned. This application Sep. 7, 1983, Ser. No. 529,927

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705228; South Africa, Dec. 5, 1977, 77/7233

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.[4] A01N *55/00, 59/26*

U.S. Cl. 424—128 12 Claims

1. In a phosphine-producing pesticide composition comprising a mixture, molded or pressed into gas permeable tablets or pellets, of (a) a pesticidially effective amount of particles of a hydrolyzable metal phosphide, (b) particles of a self-ignition inhibitor in an amount effective to protect the composition against spontaneous combustion of phosphine released from the composition upon exposure to water vapor, and (c) at least one hydrophobizing agent effective to render the composition sufficiently repellent to liquid water to reduce the likelihood of spontaneous combustion upon contact therewith, the improvement wherein the hydrophobizing agent is an amount, from about 0.1% to about 3% by weight of the pesticide composition, of a silicon-organic compound chemically bonded to the surface of at least the particles of the self-ignition inhibitor, wherein the tablets or pellets are sufficiently permeable to atmospheric humidity to cause phosphine to be released therefrom at a nearly constant rate essentially from the beginning of their exposure thereto, and wherein the silicon-organic compound is chemically bonded to the particles of the self-ignition inhibitor by reacting a reactive silicon-organic compound with the particles of self-ignition inhibitor.

4,600,585

FEEDING REGIMEN FOR MINIMIZING WEANING STRESS

Marie A. Vitcenda, and Alfred J. Zmolek, both of Elroy, Wis., assignors to Merrick's, Inc., Middleton, Wis.

Filed Jan. 23, 1984, Ser. No. 573,062

Int. Cl.[4] A23L *1/42*

U.S. Cl. 426—2 14 Claims

1. A method for minimizing weaning stress in young bovine, said method comprising the steps of:

feeding colostrum to a new born bovine to provide antibody protection,

feeding milk to said bovine for a period commencing at least by the third day following birth and continuing until at least fourteen days following birth,

and also feeding solid milk replacer pellets commencing at least by the third day following birth and continuing until at least the fourteenth day following birth,

feeding a combination of grain and solid milk replacer pellets for the period of time commencing with about the fourteenth day and at least until about the forty second day following birth and

weaning said bovine from said milk at between the fourteenth day and the twenty-first day following birth.

7. A method for early development of the rumen in newborn calves comprising the steps of feeding colostrum to provide antibody protection, feeding a fluid selected from the group consisting of whole milk and whole milk equivalent, commencing by the third day of age and continuing for up to twenty one days of age, at the same time feeding solid milk replacer commencing by the third day of age and continuing until said bovine are fourteen days of age and then feeding a combination of solid milk replacer and grain for up to forty two days following birth.

4,600,586

LIVESTOCK FEED LOT ADAPTATION COMPOSITION AND METHOD

Milton L. Green, R.R. 1, Mitchell, Nebr. 69341

Filed Aug. 8, 1983, Ser. No. 521,154

Int. Cl.[4] A23K *1/02*

U.S. Cl. 426—2 13 Claims

1. A method of preparing a feed supplement comprising as major ingredients, molasses, propylene glycol, and as minor ingredients, at least a protein mix, vitamin mix, trace mineral mix, major mineral mix, and amino acids, said method comprising:

mixing each minor ingredient separately with small but stress reducing effective amounts of propylene glycol until substantial homogeniety is attained;

adding each of the separately admixed ingredients to said molasses; and then

mixing until homogenous to provide a feed supplement which when fed to domestic livestock, will reduce considerably the length of, and amount of, lot adaptation stress.

4,600,587

PROCESS OF MANUFACTURING FROZEN DOUGH OF YEAST-FERMENTED DOUGH

Satoshi Nomura, Tokorozawa, and Shinji Ishigami, Tanashi, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Japan

Continuation-in-part of Ser. No. 563,574, Dec. 20, 1983, abandoned. This application Mar. 1, 1985, Ser. No. 707,061

Claims priority, application Japan, Jan. 28, 1985, 60-12638

Int. Cl.[4] A21D *8/00*

U.S. Cl. 426—19 4 Claims

1. A process of producing a frozen yeast fermented dough which comprises the steps of:

(a) emulsifying the total amount of water required for a dough formulation with oil or fat required for the dough formulation in the presence of a nonionic emulsifier having the HLB value of 6 to 17, at a temperature of about 25° to 50° C.,

(b) mixing the emulsified solution of step (a) with the rest of ingredients of the dough formulation to prepare a dough,

(c) fermenting the dough,

(d) dividing said fermented dough,

(e) molding each portion of the fermented dough into the desired shape, and

(f) freezing the dough to prepare a frozen dough.

4,600,588

MILK PROTEIN HYDROLYSATE AND PROCESS OF PREPARATION

John H. Ernster, 5658 Ravenspur, Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 424,754, Sep. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 350,319, Feb. 19, 1982, Pat. No. 4,363,820, which is a continuation-in-part of Ser. No. 179,771, Aug. 20, 1980, abandoned. This application Dec. 28, 1984, Ser. No. 687,203

Int. Cl.[4] A23C *9/12*

U.S. Cl. 426—42 19 Claims

1. A milk protein hydrolysate consisting of:

a quantity of an acid precipitated casein;

a quantity of an enzyme chosen from the group consisting of (1) an acid fungal protease derived from controlled fermentation of *Aspergillus niger* var and (2) a protease prepared from purified cultured liquid obtained from *Bacillus subtilis;* said protease derived from *Aspergillus niger* var being light tan to white in color, free of offensive odors, free from offensive taste, and having an optimum pH range of pH 2.5 to pH 3.5, an effective pH range of 2.5 to pH 6.0 and pH stability in the range of pH 3.0 to pH 5.0;

said protease obtained from said *Bacillus subtilis* being a clear brown liquid having a pH of pH 5.0 to pH 6.0 and having a minimum proteolytic activity of 0.5 AU/gm; said enzyme being present in an amount from about 0.001% to about 1% by weight per weight of the anhydrous form of said casein;

a quantity of an alkali compound; and

a quantity of water.

4,600,589

MEAT TENDERIZATION WITH A PROTEOLYTIC ENZYME FROM *TRICHODERMA REESEI*

Frederick M. Robbins, Ashland, Mass.; Alfred L. Allen, Pascoag, R.I.; John E. Walker, and Samuel H. Cohen, both of Framingham, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1984, Ser. No. 663,516

Int. Cl.[4] A23L *1/31*; C12N *9/58, 1/14*; C12R *1/885*

U.S. Cl. 426—56 **6 Claims**

1. A method of tenderizing meat muscle with a proteolytic enzyme obtained by the culturing of *Trichoderma reesei* strain MCG80 upon a growth medium containing an inducer of proteolytic enzyme synthesis comprising adding a proteolytically effective amount of said enzyme to meat muscle.

4,600,590

METHOD FOR INCREASING THE REACTIVITY AND DIGESTIBILITY OF CELLULOSE WITH AMMONIA

Bruce E. Dale, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Oct. 14, 1981, Ser. No. 311,168

Int. Cl.[4] A23K *1/22*

U.S. Cl. 426—69 **6 Claims**

1. A process for enhancing the cellulose digestibility and protein availability of alfalfa to enhance the alfalfa as a feed for animals, said process comprising applying ammonia to the alfalfa for a time period less than about one hour at a treatment pressure in the range of about 140 psia to about 180 psia and at a treatment temperature of about 25° C., thereby increasing the digestibility of the cellulose in the alfalfa and increasing the availablity of protein from the fibers and from within the cell walls of the the alfalfa to animals.

4,600,591

DEVICE FOR THE PRODUCTION OF ICE-CREAM CONES AND THE PRODUCT OBTAINED

Carlo Galli, Via Capua 74, Roma, Italy

Filed Nov. 26, 1984, Ser. No. 674,829

Int. Cl.[4] A21C *15/02*

U.S. Cl. 426—94 **4 Claims**

1. A device for combining inner and outer wafer conical shells such that they are spaced apart from each other and include therebetween a cream layer to form an edible composite pastry cone, said device to be mounted downstream of a machine for producing the inner and outer wafer conical shells, comprising:

(a) a continuous, step-by-step, conveyor means including a plurality of transverse rows of conical receptacles for receiving the outer wafer conical shells produced by the machine upstream;

(b) first feeding means positioned adjacent said conveyor means for inserting each outer wafer conical shell into each conical receptacle;

(c) batching means for dispensing edible cream into each outer wafer conical shell located in a conical receptacle, as each row of conical receptacles passes below said batching means;

(d) second feeding means for inserting each inner conical shell produced by the machine upstream coaxially into each outer wafer conical shell;

(e) a vertically reciprocating presser means for pressing each inner wafer conical shell into the respective outer wafer conical shell containing the cream, so as to push the inner wafer conical shell coaxially into the respective outer wafer conical shell, and

(f) means for collecting the formed edible composite pastry.

4,600,592

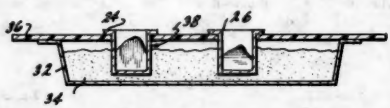
MEANS FOR DECORATING COMESTIBLE PRODUCTS

Arlene Dobis, 9032 Fullerton Ave., River Grove, Ill. 60171

Filed Feb. 1, 1985, Ser. No. 697,329

Int. Cl.[4] A23G *3/12, 3/00, 3/20, 3/28*

U.S. Cl. 426—112 **7 Claims**



1. A kit for decorating comestible products, comprising:

a mold for forming a new base comestible piece composed of chocolate material, the mold having ridges therein for forming a plurality of shallow, narrow, slit-like grooves in the outer surface of said base, said grooves being configured in a decorative design;

a hand-held tool having a thin, narrow rigid blade suitably dimensioned to fit into each one of said grooves for use as an applicator of thick, flowable confectionary materials;

a plurality of open-mouth containers containing individual ones of a plurality of different colored decorative flowable confectionary materials, said containers being composed of thermally conductive material; and

means for supporting from above said containers partially submerged in a pool of a hot liquid for supplying heat therefrom through the containers to render the decorative confectionary material flowable, so that the tool can scoop heated flowable material from individual containers and pack the flowable material down into individual ones of said grooves.

4,600,593

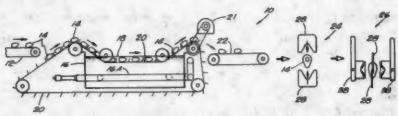
METHOD FOR REMOVING SKINS FROM AVOCADOS

Horton E. Swisher, Upland, Calif., assignor to Cal-Flo Corporation, Covina, Calif.

Continuation-in-part of Ser. No. 628,920, Jul. 9, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 778,845

Int. Cl.[4] A23L *1/212*

U.S. Cl. 426—438 **13 Claims**



1. In a method of processing whole avocados, initially having their skins generally intact and continuous, for removing their skins, the steps comprising:

immersing the whole avocados with their skins thereon in a triglyceride oil at a temperature in the range of about 275°–400° F.,

maintaining the avocados in the oil for a period of time selected to develop a relatively substantial temperature differential across the avocado skins and cause formation of a generally continuous vapor boundary between the skins and the avocado flesh, with the skin being generally intact, to facilitate removal of the skins without causing

deleterious heating of the avocado flesh and thereby minimizing development of thermal off-flavors, and

removing the avocados from the oil within the skins loosened from the avocado flesh by said vapor boundary whereupon the skins may be readily removed from the avocado flesh.

4,600,594

PROCESS FOR THE CONDITIONING OF CRUSHED OIL-CONTAINING SEEDS PRIOR TO FLAKING

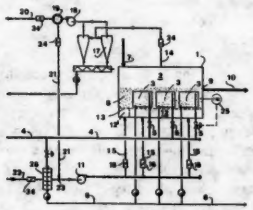
Helmut Bartesch, Ravensburg, and Gerd Florin, Vorberg, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Continuation of Ser. No. 533,820, Sep. 19, 1983, abandoned. This application Oct. 29, 1984, Ser. No. 666,123

Claims priority, application Switzerland, Sep. 30, 1982, 5748/82

Int. Cl.[4] A23L *1/36*

U.S. Cl. 426—443 **10 Claims**



1. In a method for processing oil-containing seeds wherein the seeds are crushed, conditioned by heating to reduce the viscosity of the oil and render the crushed material plastic, and rolled to form thin flakes, the improvement wherein said heating step comprises forming a bed of said crushed material fluidized by warm air; transferring heat to the material in the bed by a heat exchanger located therein to thereby raise the temperature of the material to about 55° to 75° C.; and continuously moving the crushed material through the bed without mechanical agitation and with a residence treatment time of approximately 4 to 8 minutes.

4,600,595

PREPARATION OF A ROLLED PASTRY PRODUCT

Anders G. Svengren, Ängelholm, and Bertil A. Ganrot, Bjuv, both of Sweden, assignors to Nestec S.A., Vevey, Switzerland

Filed Aug. 14, 1984, Ser. No. 640,700

Claims priority, application European Pat. Off., May 2, 1984, 84104918.2

Int. Cl.[4] A21D *6/00*

U.S. Cl. 426—501 **8 Claims**

1. A process for preparing a folded pastry product comprising:

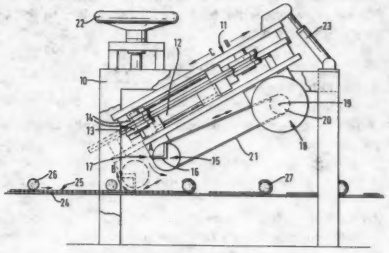
(a) advancing a sheet of pastry material in a downstream direction on a conveyor belt and,

(b) cyclically:

(i) lowering, from above the sheet towards the belt, a knife having a cutting edge extending transversely to the downstream direction across the width of the sheet, so that the cutting edge of the knife cuts through the sheet to thereby sever a piece of the pastry material downstream of the knife from the remaining sheet upstream of the knife, leaving the cut, forward edge of the remaining sheet in contact with the cutting edge of the knife;

(ii) lifting up the forward cut edge of the remaining sheet and folded it back upon the remaining sheet by raising the knife while rotating the knife in a first direction about a horizontal axis transverse to the downstream direction to impart to the cutting edge of the knife a motional vector counter to the downstream direction; and

(iii) rotating the knife during the lowering step about the



axis in a second direction, opposite to the first direction, whereby the edge folded on each cycle downstream of the knife is advanced on the belt before the knife cuts through the sheet in the next succeeding cycle.

4,600,596

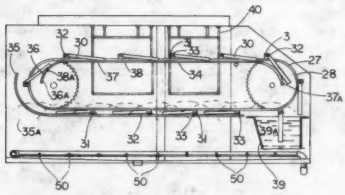
AUTOMATIC FOOD COOKING MACHINE

Nelson Gongwer, and Dean Gongwer, both of Wakarusa, Ind., assignors to Nelgo Manufacturing Corporation, Wakarusa, Ind.

Filed Sep. 29, 1983, Ser. No. 536,989

Int. Cl.[4] A23L *1/01*; A47J *37/04*

U.S. Cl. 426—523 **7 Claims**



4. A process for cooking food products in an automatic food cooking machine comprising the steps of:

(a) placing food products in a plurality of baskets attached to an endless conveyor disposed in an oven of the cooking machine;

(b) rotating the endless conveyor in the oven and transferring the baskets from a lower conveyor portion to an upper conveyor portion;

(c) maintaining a heating source in the machine and controlling the temperature in the oven of the machine above 100° C. for cooking the food products;

(d) directing water into a pipe disposed in the machine;

(e) discharging the water from a plurality of nozzles connected to the pipe;

(f) spraying a portion of the water in the oven of the machine at the heating source; and

(g) converting the water contacting the heating source into steam for increasing the humidity of the air in the cooking machine.

4,600,597

METHOD AND DEVICE FOR DETERMINING THE CONTOUR OF SPIN-COATED THIN FILMS OF MATERIAL ON SUBSTRATE TOPOGRAPHY

Lawrence K. White, Princeton Junction, and Nancy A. Miszkowski, Lawrenceville, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 29, 1984, Ser. No. 666,191
Int. Cl.[4] B05D 3/12
U.S. Cl. 427—9 12 Claims

1. A method for determining the contour of a spin-coated thin film of material on a substrate topography comprising the steps of:

(a) providing a plurality of parallel, isolated, raised lines of differing widths on a portion of the surface of a flat substrate;

(b) measuring the step height of the raised lines as deviations from another flat surface portion of said substrate;

(c) spin-coating a film of a viscous material on the surface of the substrate including said raised lines and said another flat surface portion, said film thereby defining a pattern;

(d) measuring at one or more locations of said pattern the change in step higher manifested by said film over said raised lines at each of said one or more locations to provide a plurality of height data points corresponding to said raised lines;

(e) calculating the amplitude frequency component coefficients (a_n and b_n) of a Fourier integral series in the frequency domain representing said pattern; and

(f) determining a low pass frequency filter that fits the change in step heights measured in step (d), said filter reducing the calculated amplitude of said frequency component coefficients determined by step (e);

(g) said frequency filter providing information which can be used to calculate a predicted contour of a spin-coated film of said viscous material on said substrate topography, said predicted film contour being in the form of numerical data or a pictorial display.

11. A monitor of the contour of spin-coated material comprising:

a wafer having a flat surface including topography embodying an integrated circuit pattern on said surface, said pattern being represented by a Fourier transform,

a test pattern of known topography formed on a flat surface portion of said wafer remote from said integrated circuit pattern, for monitoring the contour of viscous material spun on said integrated circuit topography, said test pattern topography comprising a pattern of a plurality of parallel, isolated, raised lines of differing widths having values lying in the range of about 1 to 100 μm.

4,600,598

CONDUCTIVE COATINGS

Ronald S. Nelson, Trinity, and John D. Loflin, Jamestown, both of N.C., assignors to The Lilly Company, High Point, N.C.

Division of Ser. No. 512,549, Jul. 11, 1983, Pat. No. 4,530,778.
This application Apr. 9, 1985, Ser. No. 721,373
Int. Cl.[4] B05D 1/04
U.S. Cl. 427—27 19 Claims

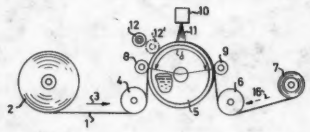
1. A method of coating dried wood comprising applying to the surface of said wood a conductive pretreatment solution comprising a volatile liquid carrier selected from the group consisting of water and organic solvents, said carrier having dissolved therein, per 100 parts by volume of total solution, (1) from 0.2 to 3 parts by volume of an organic quaternary ammonium compound having a molecular weight below about 1000, (2) from 0.2 to 10 parts by volume of a low volatile liquid polyol having a molecular weight below about 400, and (3) from 0.1 to 3 parts by weight of an inorganic ionizable salt having a capacity to absorb moisture, and dryng the same to remove said volatile carrier, then applying and drying at least one coating selected from washcoats, wiping stains, sealers, glazes, fillers, lacquer undercoats and lacquer enamels, and then electrostatically applying a solvent solution topcoat containing a film-forming resin, whereby said pretreatment is effective to assist electrostatic deposition of said topcoat without causing said topcoat to blush in humid atmospheres.

4,600,599

METHOD OF APPLYING A WEAR-RESISTANT COATING ON A THIN, METALLIC STRIP-SHAPED CARRIER MATERIAL

Hans I. Wallstén, Denans, Switzerland, assignor to Inventing S.A., Switzerland

Filed Oct. 12, 1983, Ser. No. 541,102
Claims priority, application Sweden, Oct. 13, 1982, 8205806
Int. Cl.[4] B05D 1/02, 1/08, 3/12, 5/00
U.S. Cl. 427—34 22 Claims



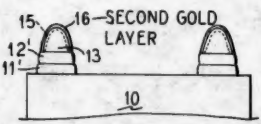
1. A method of applying a wear-resistant coating to at least one strip of metallic carrier material, the method including the steps of providing a coating apparatus having at least one coating zone therein, and at least one spraying unit at said coating zone, for spraying a molten coating agent, which, when hardened, is wear-resistant, the method further comprising subjecting the strip to a plurality of successive coating steps in each of which the strip is passed longitudinally through said coating zone to be sprayed continuously within said coating zone with a molten coating agent, the method including the step of cooling the strip between successive coating steps to remove from the strip substantially all of the heat applied in the preceding coating step by the spraying of the molten coating agent, before the next said coating step, and wherein the heat applied to the strip, in each said coating step, is so small, in relation to the heat capacity of the strip, that the temperature increase in the strip is insufficient to change the physical properties of the carrier material, all of said coating steps being carried out in a single said coating zone, and in which said strip is passed alternately backwards and fowards through the coating zone, each said coating step being carried out during a respective pass through the coating zone.

4,600,600

METHOD FOR THE GALVANIC MANUFACTURE OF METALLIC BUMP-LIKE LEAD CONTACTS

Erich Pammer, Taufkirchen, and Otfried Bischofberger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,194
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343362
Int. Cl.[4] H01L 21/60, 21/445
U.S. Cl. 427—89 7 Claims



1. In a method for galvanic manufacture of bump-like lead contacts on a semiconductor circuit, and wherein the lead contacts are formed of an etchable metal having a surface coating of gold, and wherein under the bump-like lead contacts a thin, metallic layer sequence is provided as an adhesion layer

and diffusion barrier between the lead contacts and a surface of the semiconductor circuit, wherein the improvement comprises:

after forming the metallic layer sequence on the surface of the semiconductor circuit, electrodepositing the bump-like lead contacts on the thin, metallic layer sequence, and thereafter applying a first coating of gold on the bump-like lead contacts;

employing the first gold coating as an etching protection for a subsequent etching to remove portions of the thin, metallic layer sequence not lying beneath the bump-like lead contacts;

tempering the circuit and lead contacts so that the first gold layer diffuses into the bump-like lead contacts in a region of a surface of the lead contacts; and

providing a second gold layer on the lead contacts, said second gold layer being substantially prevented from diffusing into the lead contacts by the diffused-in first gold layer near the surface of the lead contacts.

4,600,601

PROCESS OF COATING THE SURFACE OF A BOARD

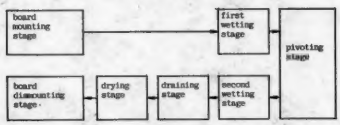
Kazuyoshi Tamura, Okazaki, Japan, assignor to Aisin Seiki Kabushikikaisha, Japan

Filed Jun. 14, 1985, Ser. No. 744,726

Claims priority, application Japan, Jun. 14, 1984, 59-122808

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 427—96 **9 Claims**



1. A process of coating the surface of a board comprising:

a liquid introducing step of providing a vessel adapted to contain a quantity of coating liquid and having a relatively large top opening and having a plurality of relatively small apertures formed in the bottom thereof and immersing the vessel into a pool of coating liquid in a reservoir;

a liquid lifting step of pulling the vessel upward from the coating liquid of the reservoir;

and a first wetting step of causing a flow of coating liquid which passes through the plurality of relatively small apertures in the bottom of the vessel to impinge upon a board by moving one of the board and the vessel relative to the other, the board being located above the liquid surface and below the vessel at an angle with respect to the plane defined by the liquid level within the reservoir.

4,600,602

LOW RESISTANCE RESISTOR COMPOSITIONS

Frank W. Martin, Baldwin Place, and Samson Shahbazi, Yonkers, both of N.Y., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 18, 1984, Ser. No. 631,975

Int. Cl.⁴ B05D *5/12*; H01B *1/06*

U.S. Cl. 427—96 **16 Claims**

1. A resistor composition capable of withstanding high humidity conditions comprising:

(A) a resin system comprising

(i) liquid short chain phenolic resin having a number average molecular weight of from about 300 to about 400;

(ii) solid long chain phenolic resin having a number average molecular weight from about 400 to about 500; and

(B) a mixture of

(i) carbon black having a surface area of from about 500 m^2/g to about 1500 m^2/g; and

(ii) graphite particles dispersed in said resin system, said composition having an electrical resistance of from about 18 to about 150 ohms/sq./mil.

4,600,603

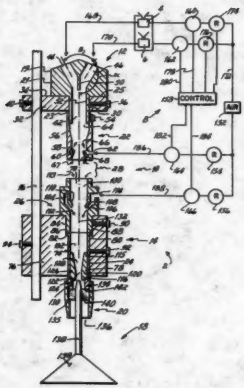
POWDER SPRAY APPARATUS AND POWDER SPRAY METHOD

Douglas C. Mulder, Wellington, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Continuation-in-part of Ser. No. 623,005, Jun. 21, 1984, Pat. No. 4,543,274. This application May 9, 1985, Ser. No. 732,375

Int. Cl.⁴ B05D *1/12*

U.S. Cl. 427—180 **29 Claims**



1. A method of spraying solid particulate powder from a powder spray gun, which gun includes a barrel and a nozzle at the discharge end of said barrel, which barrel has a central axis, which method comprises

transporting said solid particulate powder to said gun while entrained in an air stream,

passing said air entrained powder through an inverted air flow amplifier wherein said air entrained powder is impacted by a relatively high velocity air stream directed generally upstream of said barrel so as to homogenize the distribution of said air entrained powder and thereby more evenly distribute said power throughout said air stream.

4,600,604

METAL OXIDE-COATED COPPER POWDER

Vincent P. Siuta, Cherry Hill, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 651,081, Sep. 17, 1984. This application Sep. 30, 1985, Ser. No. 781,724

Int. Cl.⁴ B05D *7/00*

U.S. Cl. 427—216 **7 Claims**

1. Particles of Cu-containing metal having sintering and shrinkage characteristics which more closely match those of green ceramic tape, bearing a substantially continuous coating of at least one metal oxide having a free energy of formation more negative than −98 kcal/mole and having a particle size of 0.5–20 μm in largest dimension and a surface area less than 1.0 m^2/g.

5. A method for more closely matching the shrinkage of green ceramic tape and raising and sintering temperature of finely divided Cu-containing metal particles comprising the sequential steps of:

(a) dispersing the Cu metal particles in a solution comprising

(1) an organometallic compound of a metal, the oxide of

which has a free energy of formation more negative than −98 kcal/mole dissolved in (2) a volatile organic solvent,

(b) while maintaining the dispersion by agitation, removing the solvent by evaporation, thus forming a coating of the organometallic compound on the Cu-containing metal particles, and

(c) treating the organometallic compound-coating Cu metal particles in a reducing atmosphere at an elevated temperature and for a time sufficient to effect reduction of any copper oxide on the copper metal particles and decomposition of the organometallic compound to the corresponding metal oxide.

4,600,605

METHOD OF PRODUCING STRETCHABLE WADDING

Kiyoto Nakai, and Kanji Hosokawa, both of Moriyama, Japan, assignors to Japan Vilene Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1984, Ser. No. 642,266

Int. Cl.[4] B05D *1/02, 3/02*

U.S. Cl. 427—379 **4 Claims**

1. A method of producing stretchable wadding with an apparent density of 0.005 to 0.06 g/cm^3 and thickness-directional resiliency, which comprises:

(a) forming a non-woven web containing crimp potential fibers,

(b) spraying an adhesive over the web to provide adhesive at points three-dimensionally distributed through the web,

(c) drying the web at a temperature less than the temperature at which the fibers crimp, and

(d) shrinking the web by heating to a temperature at which the fibers crimp to form a multiplicity of crimps remaining free and unbonded in the web.

4,600,606

PROCESS FOR RENDERING NON-THERMOPLASTIC FIBROUS MATERIALS FLAME RESISTANT TO MOLTEN MATERIALS BY APPLICATION THERETO OF A FLAME RESISTANT COMPOSITION, AND RELATED ARTICLES AND COMPOSITIONS

Vladimir Mischutin, East Brunswick, N.J., assignor to White Chemical Corporation, Newark, N.J.

Continuation of Ser. No. 266,000, May 21, 1981, Pat. No. 4,446,202, which is a continuation-in-part of Ser. No. 31,307, Apr. 18, 1979, Pat. No. 4,348,306, which is a division of Ser. No. 797,767, May 17, 1977, Pat. No. 4,158,073, which is a division of Ser. No. 538,896, Jan. 6, 1975, abandoned, which is a division of Ser. No. 300,732, Oct. 25, 1972, abandoned. This application Apr. 10, 1984, Ser. No. 598,700

The portion of the term of this patent subsequent to May 1, 2001, has been disclaimed.

Int. Cl.[4] B32B *27/20*

U.S. Cl. 427—389 **21 Claims**

1. A process for rendering a non-thermoplastic fiber, fabric, or fibrous composition flame resistant when contacted with a hot molten material, that comprises applying to said fiber, fabric or fibrous composition, a flame retardant composition comprising a water-insoluble, non-phosphorous containing brominated aromatic or cycloaliphatic organic compound and a metal oxide, or mixtures of said oxide and a metal hydrate in an, in an aqueous dispersion of a water-insoluble polymeric adhesive binder, and curing said flame retardant composition on said fiber, fabric, or fibrous composition.

4,600,607

BONDING A SIALON COATING TO A SUBSTRATE

Ke-Chin Wang, Pittsburgh; Eugene T. Rushe, Port Vue, and Howard M. Winkelbauer, McKeesport, all of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 10, 1985, Ser. No. 690,280

Int. Cl.[4] B05D *1/02*

U.S. Cl. 427—421 **7 Claims**

1. A coating for a refractory substrate comprising a slip formed from water, sodium silicate, and sialon powder, with the ratio of water to sodium silicate, on a volume percent basis, ranging from 2.3:1 to 4:1, and further including 0.01 to 0.15 weight percent defoaming agent.

3. A method of forming a coating for a substrate comprising the steps of:

preparing a mix comprising water and sodium silicate;

adding sialon powder to the mix;

adding a relatively small amount of defoamer to said mix; and

spraying the mix onto the substrate to form a coating thereon.

4,600,608

SURFACE COATING APPARATUS AND METHOD

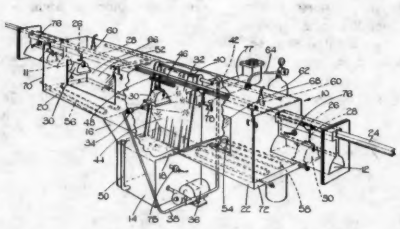
Dennis R. Ankrett, Birmingham, England, assignor to Lucas Industries, Birmingham, England

Filed Oct. 8, 1982, Ser. No. 433,422

Claims priority, application United Kingdom, Oct. 17, 1981, 8131388

Int. Cl.[4] B05D *1/04;* **B05C** *15/00*

U.S. Cl. 427—424 **10 Claims**



1. Apparatus for surface coating articles comprising a closed chamber having an inlet for articles to be surface coated and an outlet for articles which have been surface coated; means for transporting the articles through said closed chamber from said inlet to said outlet; a coating station in said chamber through which articles are transported in use to be surface coated; means for supplying a surface coating composition containing a coating material and a solvent to said coating station; an inert gas source; means for feeding inert gas from said source into said chamber; a reservior opening into said chamber; means for collecting (a) solvent from said coating composition and (b) excess coating composition in said reservoir, the arrangement being such that, in use, an atmosphere is maintained in the closed chamber which is substantially saturated with said solvent and in which oxygen is maintained below a predetermined level;

means for creating a localized negative pressure in the chamber at at least one location, said negative pressure being sufficient to encourage a general flow of vapour away from at least one of said inlet and said outlet; and a differential pressure transducer for comparing atmospheric pressure with said localized negative pressure and causing introduction of inert gas when a pressure difference is detected.

4,600,609

METHOD AND COMPOSITION FOR ELECTROLESS NICKEL DEPOSITION

Harold Leever, Bethlehem, and Leo J. Slominski, Bristol, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed May 3, 1985, Ser. No. 730,763

Int. Cl.[4] C23C *3/02*

U.S. Cl. 427—438 **29 Claims**

1. In a method for depositing a metal coating consisting essentially of nickel on the surface or surfaces of a substrate,

comprising immersing said substrate in an aqueous solution comprising as ingredients a source of nickel ions, a soluble reducing agent for the nickel, a metal complexing agent and pH adjusting agents under conditions effective to bring about electroless deposition of nickel on said surface or surfaces by means of chemical reduction; the improvement comprising including a soluble acetylenic compound as an ingredient in said solution in an amount effective to improve the brightness of said nickel coating, the particular ingredients of said solution and their concentrations therein being such as to provide said bright nickel coating without substantially decreasing the electrodes depositing rate of the solution, as compared to the depositing rate obtained with a corresponding solution not containing acetylenic compound, said effective amount of said acetylenic compound being in excess of about 100 ppm when said acetylenic compound is butynediol.

15. In an aqueous electroless nickel plating solution consisting essentially of a source of nickel ions, a soluble reducing agent for nickel, a metal complexing agent and pH adjusting agents; the improvement comprising an effective amount of a soluble acetylenic compound in said solution as an ingredient to improve the brightness of the nickel coating, the particular ingredients of said solution and their concentrations therein being such as to provide said bright nickel coating without substantially decreasing the electroless depositing rate of the solution, as compared to the depositing rate obtained with a corresponding composition not containing acetylenic compound, said effective amount of said acetylenic compound being in excess of about 100 ppm when said acetylenic compound is butynediol.

4,600,610

MOLDED BODY FOR EMBEDDING RADIOACTIVE WASTE AND PROCESS FOR ITS PRODUCTION

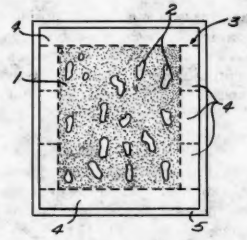
Milan Hrovat, Rodenbach; Hans Huschka; Lothar Rachor, both of Hanau; Thomas Schmidt-Hansberg, Frankfurt, and Reinhard Kroebel, Gondelsheim, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 9, 1982, Ser. No. 440,314

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144754

Int. Cl.⁴ G21F *9/16*

U.S. Cl. 428—2 **21 Claims**



1. A molded body comprising graphite and an inorganic binder for the safe, long time fixation of radioactive or toxic waste consisting essentially of (1) a nucleus containing the waste bound in a matrix of graphite and inorganic binder and (2) a surrounding shell of the same matrix free of waste, the shell having been pressed on the matrix at a pressure of 10 to 100 MN/m^2, the molded body having a density above 90% of the theoretical value and very tight and free from pores which go through the molded body.

4,600,611

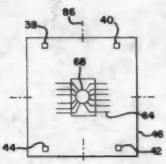
FILM CARRIER FOR MANUFACTURING SEMICONDUCTOR DEVICES

James W. Clark, San Jose, Calif., assignor to Fairchild Semiconductor Corporation, Cupertino, Calif.

Filed May 2, 1985, Ser. No. 730,663

Int. Cl.⁴ B32B *3/10*; H01L *23/02, 23/12*

U.S. Cl. 428—13 **1 Claim**



1. An improved film carrier for film having serially arrayed laterally opposed sprocket holes disposed thereon, said film being utilized in the manufacture of semiconductor devices, said film carrier comprising:

a main frame member having an opening extending therethrough;

a snap in film carrier and locator plate having alignment pins extending therefrom, said pins being positioned for mating engagement with said sprocket holes in said film, said alignment pins being sized relative to said sprocket holes in such a manner that said film may float about the true center of said film carrier and locator plate, said film carrier and locator plate further having a pair of opposed center line holes positioned for insertion of process tooling pins, said film carrier and locator plate having a central aperture extending therethrough adapted for performing lead bonding of a semiconductor device to said film; and

a cover plate constructed and arranged for mating engagement with said film carrier and locator plate so as to capture a single film frame within said film carrier and locator plate by interlocking with said alignment pins, said cover plate having an aperture extending therethrough for subsequent lead bonding and having a pair of opposed center line sprocket holes for reception of processing tooling pins.

4,600,612

COORDINATED FLORAL ARRANGEMENT ASSEMBLY SYSTEM AND METHOD

Robert G. Litwin; Erwin R. Stone, both of Concord, Calif., and Asset K. Mitra, 620 Montezuma Ct., Walnut Creek, Calif. 94598, assignors to Asset K. Mitra, Walnut Creek, Calif.

Filed Feb. 20, 1985, Ser. No. 704,301

Int. Cl.⁴ A41G *1/00*

U.S. Cl. 428—23 **6 Claims**

1. A coordinated floral arrangement assembly system, comprising

a plurality of artificial flowers, each of said artificial flowers includes an elongated stem member that has two end portions, a plurality of petals which are positioned adjacent to one of said stem member end portions, a plurality of leaves which are positioned on said stem member intermediate of said end portions, and a positional indicator positioned adjacent to a second of said stem member end portions, said positional indicator has an indicium thereon;

a base member, said base member, which is adapted to receive said flowers, has at least one generally horizontal, imperforate surface; and

a floral arrangement positional template, said template, which is adapted to be positioned atop said foam base member horizontal surface, has an imperforate surface that includes a plurality of positional markers which are in

coplanar relationship with said template surface, each of said markers has an associated indicium, whereby

a stem member that has a particular indicium on its stem member positional indicator is mounted onto said base

member by perforating said template surface immediately adjacent to a template positional marker the associated indicium for which is identical to said stem member indicium.

4,600,613

MEDICAL BAG

Takao Yoshida, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,335

Claims priority, application Japan, Apr. 25, 1983, 58-72398

The portion of the term of this patent subsequent to Dec. 5, 2001, has been disclaimed.

Int. Cl.[4] B65D *31/02*

U.S. Cl. 428—35 **12 Claims**

1. A medical bag comprising:

a pair of heat-sealabe soft plastic sheets disposed opposing each other, said sheets having peripheral portions which are sealed together so as to form a bag main body; and

substantially non-flowable, substantially continuous layers covering those portions of opposing surfaces of said sheets at least at portions of said opposing surfaces other than said peripheral portions, said substantially non-flowable layers comprising a silicone resin composition, said silicone resin composition being at least partially crosslinked.

4,600,614

HIGH-FREQUENCY HEATABLE PLASTICS

Gerald M. Lancaster, Freeport, and James A. Allen, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 12, 1983, Ser. No. 531,110

Int. Cl.[4] B27N *5/02*

U.S. Cl. 428—35 **20 Claims**

1. A high-frequency electromagnetic radiation sealable multi-ply article comprising two (a) plies in sealable contact with each other, with their reverse surfaces in sealable contact with (b) plies,

wherein each (a) ply comprises an olefin/carbon monoxide interpolymer in which about 0.1% to about 50% of the interpolymer weight is atrributable to carbon monoxide, and each (b) ply comprises a material which is unsuited or ill-suited as a high-frequency electromagnetic radiation sealable material.

4,600,615

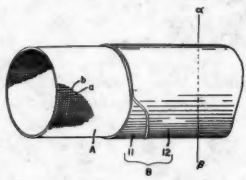
TUBULAR LINING MATERIAL AND A METHOD AND APPARATUS FOR MANUFACTURING SAME

Masakatsu Hyodo; Koji Kusumoto, and Isaburo Yagi, all of Osaka, Japan, assignors to Ashimori Industry Co., Ltd., Osaka, Japan

Filed Feb. 21, 1985, Ser. No. 703,908

Int. Cl.[4] F16L *55/18*

U.S. Cl. 428—36 **5 Claims**



1. A pipe provided with a tubular lining material which comprises a tubular textile jacket having on the external surface thereof a coating of plural synthetic resins in the form of laminated layers, characterized in that the outermost layer of the coating is composed exclusively or predominantly of a thermoplastic polyester elastic resin and the innermost layer of the coating is composed exclusively or predominantly of a thermoplastic polyurethane elastic resin, the coating having been bonded superficially onto the external surface of the tubular textile jacket.

4,600,616

HEAT-SHRINKABLE LAMINATE FILM

Masaki Ohya, and Yoshiharu Nishimoto, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,349

Claims priority, application Japan, Nov. 1, 1983, 58-205461

Int. Cl.[4] B32B *27/08, 33/00, 31/30*

U.S. Cl. 428—36 **4 Claims**

1. A heat-shrinkable laminate film comprising outer layers of a polyolefin, a gas-barrier layer of a copolymer of vinylidene chloride, at least one intermediate layer of an ionomer and adhesive layers disposed between any of the above layers,

the total thickness of the intermediate layer(s) of an ionomer being 5 to 20% of the total thickness of the heat-shrinkable laminate film, and

(i) at least one of the outer layers being a copolymer of ethylene and vinyl acetate of a crystal melting point in a range of from 80° to 103° C. and another outer layer being a linear, low density polyethylene of a crystal melting point in a range of from 110° to 130° C. or a mixture of not more than 40% by weight of the linear, low density polyethylene and not less than 60% by weight of a copolymer of ethylene and vinyl acetate of a crystal melting point in a range of from 80° to 103° C., or

(ii) each of the outer layers being a mixture of not more than 40% by weight of a linear, low density polyethylene of a crystal melting point in a range of from 110° to 130° C. and not less than 60% by weight of a copolymer of ethylene and vinyl acetate of a crystal melting point in a range of from 80° to 103° C.

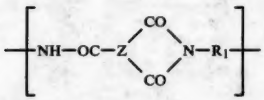
4,600,617

CONTINUOUS FIBER INSERTS FOR INJECTION MOLDED PARTS

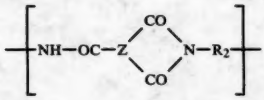
Bill W. Cole, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 27, 1984, Ser. No. 604,986
Int. Cl.[4] B29F *1/00*; B32B *17/10, 27/12*
U.S. Cl. 428—64 **9 Claims**

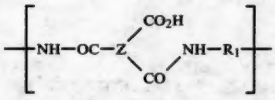
1. A molded object comprising the following structure:



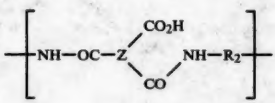
and units of:



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit coated with continuous graphite fiber or woven graphite fabric or graphite unidirectional tape impregnated with a polyamide-imide of the following structure:

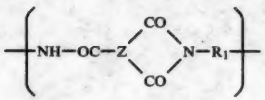


and units of:

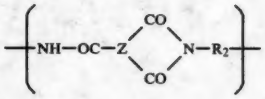


wherein the free carboxyl groups are ortho to one amide group, Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are the same or are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit.

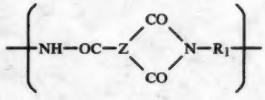
4. A molded object comprising the following structure:



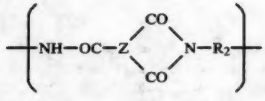
and units of:



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit coated with a graphite fabric impregnated with a polyamide-imide of the following structure:



and units of:



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower-alkyl-substituted trivalent benzene ring, R_1 and R_2 are different and are divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, —SO_2—, and —S— radicals and wherein said R_1 and R_2 containing units run from about 10 mole percent R_1 containing unit and about 90 mole percent R_2 containing unit to about 90 mole percent R_1 containing unit and about 10 mole percent R_2 containing unit.

4,600,618

SPLINT MATERIAL WITH HOOK AND LOOP FASTENER

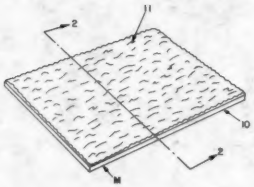
Paul G. Raychok, Jr., 6953 Clock Gate, Troy, Mich. 48098, and Linda K. Katt, 604 Fox River Dr., Bloomfield Hills, Mich. 48013

Filed Mar. 16, 1984, Ser. No. 591,399
Int. Cl.[4] A61F *5/04*
U.S. Cl. 428—92 **7 Claims**

1. Splint material adapted for use as a splint and the like comprising

a shape retaining sheet of thermoplastic material which is readily formed when the plastic is heated to an elevated temperature,

and a layer of loop pile material bonded to substantially the entire surface of one face of said sheet such that the material may be cut to the desired configuration, heated, and deformed about the limb and a strap having a plurality of hooks thereon at each end thereof may be mechanically adhered to the loop material to hold the hot sheet until it is cooled and may be readily released therefrom or left in position.

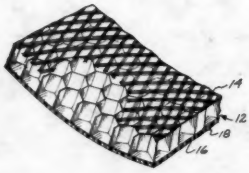


4,600,619

CONTINUOUSLY WOUND FILAMENT STRUCTURE FOR USE IN NOISE ATTENUATION ELEMENT

Wan T. Chee, and George W. Quigley, both of Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1984, Ser. No. 687,905
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—118 **6 Claims**



1. An acoustic treatment structure for use in the inlet of a turbofan engine formed by the process of filament winding an inner porous skin over a mandrel shaped to substantially conform to the inner shape of the turbofan inlet, said mandrel having pins protruding from the surface thereof, said pins being of a length greater than the thickness of said inner skin, said filaments of said inner skin filling the spaces between said pins such that said inner sheet contains perforations corresponding to the locations of said pins upon removal from said mandrel, placing a preformed honeycomb core panel over said inner skin, said pins of said mandrel being of a length less than the thickness of said honeycomb core panel, and filament winding a nonporous outer skin over said honeycomb core panel while in place over said mandrel.

4,600,620

ARTICLE SUITABLE FOR WIPING SURFACES

John Lloyd, and George K. Rennie, both of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 11, 1983, Ser. No. 522,272
Claims priority, application United Kingdom, Aug. 13, 1982, 8223346; Feb. 11, 1983, 8303872
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—195 **16 Claims**

1. An article suitable for wiping surfaces, said article comprising a sheet substrate carrying a liquid active material and having

(a) a core of bulky high-porosity fibrous sheet material having a base weight of at least 30 g/m^2, said core containing said liquid active material,

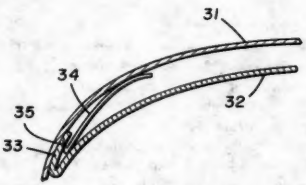
(b) at least one external wiping surface having open areas and having flattened areas of thermoplastic fibres coalesced by the application of heat and pressure to such an extent as substantially to lose their fibrous identity.

4,600,621

THERMOFORMABLE POLYMERIC FOAM HEADLINERS

Richard P. Maurer, Wilbraham, Mass., and James S. Holtrop, South Windsor, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1984, Ser. No. 687,063
Int. Cl.[4] B32B *3/04, 3/06, 7/09*
U.S. Cl. 428—121 **8 Claims**



1. A thermoformable laminate structure of at least one sheet of thermoplastic foam having a polymer-impregnated cloth adhered to at least one side thereof, wherein in a margin of said structure said sheet is substantially compressed and wherein an outer edge portion of said substantially compressed margin is retroflexed onto an inner edge portion of said substantially compressed margin.

4,600,622

SCREEN FOR SEPARATING AND CLASSIFYING PARTICULATE MATERIAL AND METHOD OF MAKING SAME

James D. Carlson, Carbondale, Pa., and Stephen L. Colucci, Mishawaka, Ind., assignors to National-Standard Company, Niles, Mich.

Division of Ser. No. 458,484, Jan. 17, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,274
Int. Cl.[4] B32B *3/10, 3/24*
U.S. Cl. 428—135 **13 Claims**

1. An improved screen for separating and classifying smaller particles of a substance from larger particles thereof, wherein the screen is of a substantially planar configuration including a top surface, a bottom surface and a plurality of spaced perforations of substantially uniform configuration and dimensions therethrough for passing the smaller particles through the screen, the improvement comprising substantially all of the

perforations each including a longitudinal cross-sectional configuration defined by:

(a) a straight wall disposed substantially perpendicular to the top and bottom surfaces;

(b) an inclined wall disposed opposite the straight wall for defining a relief angle;

(c) wherein both walls form an asymmetrical taper converging towards the top surface; and

(d) the straight walls being positioned at the downstream side and the inclined walls being positioned at the upstream side of the screen when the screen is disposed in an inclined position of use.

4,600,623

PADDED MATERIAL

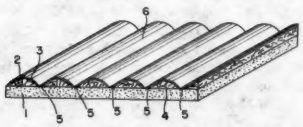
Falk R. Horn, Laudenbach; Roland Schmitt, Weinheim-Sulzbach; Manfred Gürr, Birkenau-Hornbach, and Rolf Grimm, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,178

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3347062

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—151 **5 Claims**



1. A padded material comprising a porous resilient layer of a nonwoven material of bonded randomly laid fibers and/or filaments, said layer being bonded on one side thereof to a foam web of a closed-cell crosslinked polyethylene foam and on the other side thereof to a covering web, said covering web being of a foam artificial leather of PVC, at least the foam web and the covering web consisting of a waterproof thermoplastically softenable material, and at least the covering web is softened by heating and compressed with the resilient layer being compressed pore-free in closely adjacent areas and cooled to stabilize the structure.

4,600,624

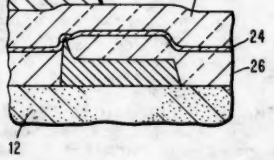
COMPOSITE INSULATOR STRUCTURE

Robert R. Joseph, and Man-Chong Wong, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1983, Ser. No. 534,046

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—161 **1 Claim**



1. In a semiconductor device having at least two levels of metallization, wherein the top surface of the one of said levels of metallization which is closer to said device is characterized by a bulge caused by a contaminant or unwanted projection, a composite insulator deposited between said levels of metallization for reducing insulator failures between said levels of metallization, said composite insulator comprising:

a first substantially conformal layer of dielectric material located over said one of said levels of metallization and covering said bulge, said dielectric material comprising plasma deposited SiOx, Si_xN_y of silicon oxynitride,

a second layer of dielectric material on said first layer, said first layer being thinner than said second layer, and

a third layer of dielectric material contiguous to and between said first layer and said one of said levels of metallization,

said first layer being thinner than said third layer.

4,600,625

OPTICAL INFORMATION RECORDING MEDIUM

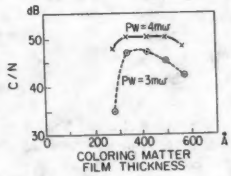
Michiharu Abe, and Hideaki Oba, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 547,708, Nov. 1, 1983, abandoned. This application Sep. 18, 1984, Ser. No. 651,725

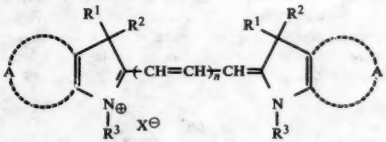
Claims priority, application Japan, Nov. 8, 1982, 57-194630

Int. Cl.[4] B32B *3/16, 23/00, 7/02*

U.S. Cl. 428—167 **60 Claims**



1. An optical information recording medium which comprises a substrate and a recording layer on said substrate, said recording medium being free of a reflective metal layer, said recording layer being a monolayer consisting essentially of cyanine dye having the formula;



wherein R^1, R^2 and R^3 can be the same or different, and each is alkyl having 1 to 6 carbon atoms; X is halogen, perhalogenate, boron tetrafluoride, toluenesulfonic acid or alkylsulfonic acid; A is phenylene, substituted phenylene, naphthylene or substituted naphthylene, wherein the substituent on said substituted phenylene and naphthylene is selected from the group consisting of alkyl, alkoxy, hydroxy, carboxyl, halogen, allyl or alkylcarboxyl; and n is an integer of 1–3 or a mixture of said cyanine dye with another coloring material which absorbs radiation of near infra-red wavelength.

4,600,626

WEBBING SUITABLE FOR USE IN VEHICLE SEAT BELT SYSTEM

Shigeji Ogata, Ayase, Japan, assignor to NSK-Warner K.K., Japan

Filed Aug. 20, 1985, Ser. No. 767,416

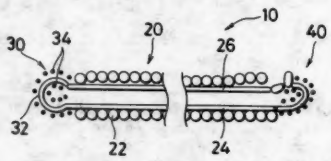
Claims priority, application Japan, Sep. 28, 1984, 59-145947[U]

Int. Cl.[4] A62B *35/00;* **D03D** *15/00, 51/00*

U.S. Cl. 428—193 **12 Claims**

1. In a webbing suitable for use in a vehicle seat belt system,

including a laterally-central main portion, and a woven selvedge portion and a knitted selvedge portion which are formed respectively along both side edges of the main portion, the improvement wherein the weave of the main portion comprises a number of wefts composed respectively of first weft threads and second weft threads inserted in pairs, the first weft threads have relatively low bending stiffness and the second weft threads have relatively high bending stiffness, the second



weft threads are woven only in the main portion, the first weft threads are contained not only in the main portion but also in the knitted selvedge portion where the first weft threads are intertwined with their corresponding catch threads, which hold their associated wefts and comprise threads having relatively low bending stiffness, to form a hollow selvedge, and the woven selvedge portion forms a hollow selvedge with the first weft threads only.

4,600,627

SANDWICH GLASSES

Toshio Honda, Akigawa; Itsuo Tanuma, Sayama; Hideo Takeichi, Tanashi; Hiromi Oturu, Akigawa, and Yasuhiro Morimura, Kunitachi, all of Japan, assignors to Bridgstone Corporation, Tokyo, Japan

Filed Apr. 18, 1985, Ser. No. 724,741

Claims priority, application Japan, Apr. 24, 1984, 59-81172; Apr. 24, 1984, 59-81173

Int. Cl.[4] B32B *3/00, 7/14*

U.S. Cl. 428—203 **7 Claims**

1. A sandwich glass comprising two glass plates and a laminate interposed therebetween, said laminate consisting of (A) at least two intermediate layers each composed of, an ethylene-vinyl acetate copolymer containing an organic peroxide and (B) an organic resin film layer interposed between said intermediate layers.

4,600,628

THERMAL TRANSFER RECORDING MEDIUM

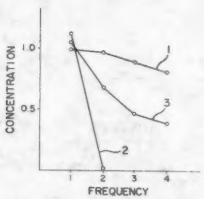
Fumio Ishii, Akishima, and Yoshihiro Inaba, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,004

Claims priority, application Japan, Mar. 2, 1984, 59-38824

Int. Cl.[4] B41M *5/26*

U.S. Cl. 428—216 **27 Claims**



1. A thermal transfer recording medium comprising a support, an interlayer provided on said support and a coloring agent layer provided on said interlayer, said coloring agent layer contains a coloring agent and a reactive polymer and said interlayer contains a cross-linking agent which reacts with said reactive polymer.

4,600,629

SELECTIVELY ABSORBENT MASK PRINTING PROCESS

David H. Knapp, Westfield, and Robert E. Lafler, Charlton City, both of Mass., assignors to Westvaco Corporation, New York, N.Y.

Filed Sep. 16, 1985, Ser. No. 776,600

Int. Cl.[4] B32B *29/06*; B05D *5/06*

U.S. Cl. 428—201 **10 Claims**

1. A method of printing indicia on an uncoated paper substrate, said method comprising the steps of:

printing an indicia pattern on one face of said substrate with a colorless solution of polyol dissolved in a high boiling point solvent of the glycol ether genus; and,

coating said indicia printed face of said substrate, including said indicia pattern, with a colored ink.

10. The printed article product of the printing process described by claim 1.

4,600,630

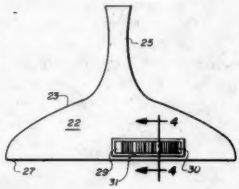
METHOD FOR MAKING A PROTECTIVE COATING ON A MACHINE-READABLE MARKING AND THE PRODUCT THEREOF

Robert L. Quinn, Ewing Township, Mercer County; Philip M. Heyman, West Windsor Township, Mercer County, and Abraham Goldman, South Brunswick Township, Middlesex County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 28, 1983, Ser. No. 536,455

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—203 **3 Claims**



1. A workpiece comprising a glass main body and a machine-readable marking on a portion of said body, said body and said marking being resistant to temperatures in the range of about 400° to 450° C. said marking and the surrounding surface thereof having substantially different light reflectances, and a transparent overcoating over said marking, said overcoating consisting essentially of an unbroken nontacky film of an ultraviolet-cured, organic, polymeric material, said overcoating being substantially completely gasifiable by heating in air at temperatures in the range of about 300° to 450° C., said overcoating being resistant to processes which may deposit extraneous material on said marking, which material may interfere with the machine readability of said marking.

4,600,631

ULTRA TOUGH PLASTIC MATERIAL

Philip E. Alei, Clute, Tex., and Nam P. Suh, Sudbury, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 1, 1984, Ser. No. 605,916

Int. Cl.[4] D04H *1/58, 1/04*

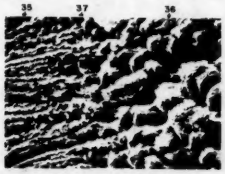
U.S. Cl. 428—212 **13 Claims**

1. A polymeric plastic material comprising

a first polymeric plastic component forming a matrix, the

molecules of first said component being substantially non-oriented molecules;

a second polymer plastic component being distributed within the matrix formed by said first component, the molecules of said second component being substantially oriented molecules;



said first and second polymer plastic components having interface regions therebetween in which regions said first and second components are substantially diffused with each other.

4,600,632

UV-STABILIZED POLYCARBONATE MOULDINGS

Winfried Paul, Krefeld; Hartmut Löwer, Hilden; Peter R. Müller, Leverkusen, all of Fed. Rep. of Germany; Mark W. Witman, Pittsburgh, Pa., and Siegfried Storp, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1985, Ser. No. 722,581

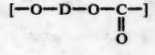
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414116

Int. Cl.⁴ B05D *7/00*

U.S. Cl. 428—220 **11 Claims**

1. A UV-stabilised polycarbonate moulding with a thickness of 0.01 mm to 1.2 mm, made of a thermoplastic polydiorganosiloxane/polycarbonate block copolymer with a mean weight-average molecular weight ($\overline{M}w$) of 10,000 to 200,000, consisting of

(A) 85% by weight to 99.5% by weight, based on (A)+(B), of aromatic carbonate structural units of the general formula

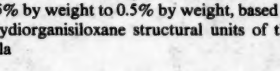


(I)

in which

—O—D—O— is a diphenate radical,

(B) 15% by weight to 0.5% by weight, based on (A)+(B), of polydiorganisiloxane structural units of the general formula



(II)

in which

radicals R are identical or different and denote a linear C_1–C_{20}-alkyl, branched C_3–C_{20}-alkyl, halogenated linear C_1–C_{20}-alkyl, halogenated branched C_3–C_{20}-alkyl, C_6–C_{20}-aryl or halogenated C_6–C_{20}-aryl radical,

n is an integer between 5 and 100 and

—O—D—O— has the foregoing meaning for its part of the structural unit of formula (I), and

(C) structural units of chain stoppers and, if desired, branching agents,

in which the block copolymer contains a UV absorber said UV absorber being concentrated on its surface.

4,600,633

POLYETHYLENE SUPERTHIN FILM AND A PROCESS FOR THE PRODUCTION OF THE SAME

Koichi Kono; Shoichi Mori; Kenji Miyasaka, and Jyoichi Tabuchi, all of Iruma, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,803

Claims priority, application Japan, Apr. 27, 1984, 59-83873

Int. Cl.⁴ B29C *41/12, 43/22;* **B29K** *23/00;* **B29L** *7/00*

U.S. Cl. 428—220 **14 Claims**

1. A polyethylene superthin film consisting of polyethylene having a weight average molecular weight of at least 5×10^5, and having a thickness of at most 3 μm, a tensile modulus of at least 2000 kg/cm², a breaking strength of at least 500 kg/cm² and a haze of at most 10%.

4. A process for the production of a polyethylene superthin film having a thickness of at most 3 μm, a tensile modulus of at least 2000 kg/cm², a breaking strength of at least 500 kg/cm² and a haze of at most 10%, which comprises heating and dissolving polyethylene having a weight average molecular weight of at least 5×10^5 in a solvent with sufficient agitation to ensure the complete dissolution of the polyethylene in the solvent, forming a gel sheet from the resulting solution by subjecting the polyethylene solution to extrusion through a die or to spreading over a support, and cooling and gelling at a temperature below the gelling temperature and at a cooling rate of at least 50° C./min., subjecting the gel sheet to a solvent removal treatment to adjust the amount of the solvent in the gel sheet to 10 to 80% by weight, heating and stretching the sheet biaxially simultaneously or in sequence at a temperature of from the α-dispersion point to the crystal melting point of the polyethylene with a surface magnification of at least 10 times, removing the residual solvent therefrom and then subjecting the stretched product to a compressing treatment at a temperature of 80° to 140° C. using a press or roll.

4,600,634

FLEXIBLE FIBROUS ENDOTHERMIC SHEET MATERIAL FOR FIRE PROTECTION

Roger L. Langer, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 515,768, Jul. 21, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,947

Int. Cl.⁴ B32B *5/02, 5/16*

U.S. Cl. 428—220 **22 Claims**

1. An endothermic, flexible, fibrous sheet material at least 4 millimeters thick made of a composition comprising:

(a) a refractory inorganic fiber;

(b) an organic polymer binder; and

(c) an inorganic, endothermic filler which undergoes an endothermic reaction between about 100° and 600° C.,

said endothermic flexible fibrous sheet having: a weight ratio of organic to inorganic constituents of less than about 0.10, a density of at least 0.6 g/cc, and a weight ratio of inorganic endothermic filler of part (c) to inorganic fiber of part (a) in the range of about 0.5 to 40.

4,600,635

BITUMEN ADHESIVE AND WATERPROOFING MEMBRANES CONTAINING SAME

Robert A. Wiercinski, Somerville, and Stephen J. Whicher, Wakefield, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Apr. 17, 1985, Ser. No. 723,995

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—220 **19 Claims**

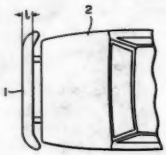
1. A pressure sensitive adhesive composition comprising bitumen, an oil which is not naturally occurring in said bitumen and is selected from the group consisting of naphthenic oils, paraffinic oils, and aromatic oils, an ionomeric elastomer, and gilsonite.

4,600,636

CORE MATERIAL FOR AN AUTOMOBILE BUMPER

Shohei Yoshimura, Tomioka, and Akira Adachi, Sakura, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,937
Claims priority, application Japan, Mar. 8, 1984, 59-44541
Int. Cl.[4] B32B *3/18, 5/18*
U.S. Cl. 428—304.4 8 Claims



1. A core material for use in automobile bumpers, said core material being composed of a molded article of prefoamed particles of a polyolefin resin, and having a density of 0.05 to 0.15 g/cm^3 and the relation represented by the following expression

$$E_{20}/\rho \geq 20 \text{ kg-cm/g}$$

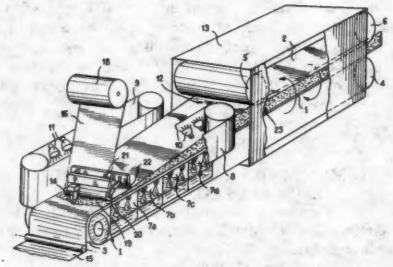
wherein E_{20} is the amount of energy absorption (kg-cm/cm^3) when the core material is compressed to 50% at 20° C., and ρ is the density (g/cm^3) of the core material, wherein said particles are nearly spherical in shape, have a particle diameter of 2 to 15 mm, a cell diameter of 0.10 to 2.00 mm and a proportion of closed cells of at least 90% and contain air filled within the cells.

4,600,637

PROCESS FOR THE CONTINUOUS PRODUCTION OF COMPOSITE FOAM PANELS AND RESULTANT PRODUCT

Bernard Kafka, Rantigny; Jean-Paul Meunier, and Serge Have, both of Clermont, all of France, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Apr. 23, 1984, Ser. No. 603,172
Claims priority, application France, Apr. 22, 1983, 83 06624
Int. Cl.[4] B29C *39/16, 39/18, 39/20*
U.S. Cl. 428—318.4 11 Claims



1. A process for the continuous production of foam panels, comprising:

casting a mixture of a heat expandable resin onto a lower facing, which lower facing is advanced on a conveyor,

heating said cast mixture during said advance by application of heat from the side of said lower facing opposite said cast mixture, causing expansion of said cast mixture and hardening of that portion proximal to said lower facing,

applying an upper facing to said cast mixture opposite said lower facing during said advance, thereby forming a composite,

advancing said composite prior to complete expansion thereof into a heated enclosure while the portion of expanded cast mixture distant from said lower facing is not hardened, limiting said expansion by provision of a second conveyor in said heated enclosure parallel to and opposite said first conveyor,

thereby limiting and calibrating the thickness of said formed composite which is subsequently completely hardened, and

cutting said composite into panels.

11. The panel produced according to the process of claim 1.

4,600,638

MAGNETIC RECORDING MEDIUM

Tadashi Ishikuro; Ryuji Shirahata; Takahito Miyoshi, and Masaaki Fujiyama, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 15, 1984, Ser. No. 610,230
Claims priority, application Japan, May 16, 1983, 58-84075
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—323 16 Claims

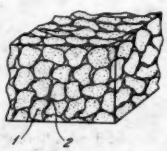
1. A magnetic recording medium comprising a non-magnetic support having, on opposite surfaces thereof, a magnetic recording layer containing magnetic particles and a backing layer containing carbon black and other inorganic particles and a binder having a thickness of not more than 2μ, the backing layer containing (a) carbon black having an average particle size of 60 to 120 mμ and (b) other inorganic particles having an average particle size of 20 to 100 mμ and wherein the weight ratio of (a) carbon black to (b) the other inorganic particles is 0.5/99.5 to 40/60.

4,600,639

ELASTIC FLOOR COVERING AND PROCESS FOR MAKING SAME

Jacques Berlemont, Paris, France, assignor to Etablissements Boulenger, France

Filed Feb. 21, 1984, Ser. No. 582,080
Claims priority, application France, Feb. 21, 1983, 83 02762
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—327 6 Claims



1. An elastic floor covering comprising a first layer of a hardenable composition having a polyurethane resin binding agent having a granular material interspersed therein, said granular material being a synthetic rubber, a natural rubber, or a synthetic plastic, and a finishing layer comprising a polyurethane resin binding agent, a solvent, a plasticizer, and a powder wherein said powder is a sanding product of said first layer after hardening.

4,600,640

THERMOPLASTIC RESINOUS SUBSTRATES HAVING AN EXTERNAL THIN GLASS SHEET PROTECTIVE LAYER

Daniel R. Olson, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 13, 1984, Ser. No. 639,709
Int. Cl.[4] B32B *27/30, 27/38, 17/10*
U.S. Cl. 428—332 **9 Claims**

1. An article comprising thermoplastic substrate bonded by a UV cured adhesive interlayer on at least one surface to a laid on sheet of thin glass which glass has a thickness of from about 0.3 mil to about 10 mils.

4,600,641

ELEMENT FOR ELECTROPHORESIS

Masashi Ogawa, Asaka; Hisashi Shiraishi, and Teppei Ikeda, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 611,591, May 18, 1984, abandoned. This application Jun. 26, 1985, Ser. No. 749,125
Claims priority, application Japan, May 19, 1983, 58-87966
Int. Cl.[4] C09J *7/02*
U.S. Cl. 428—355 **8 Claims**

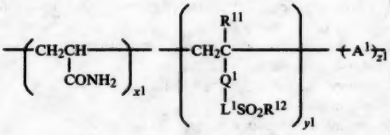
1. An element for electrophoresis comprising the following three-layer structure laminated in the order:

(I) a support layer;

(II) an adhesive layer comprising a polymer having at least one repeating unit selected from the group consisting of:

(1) a repeating unit having the formula (1):

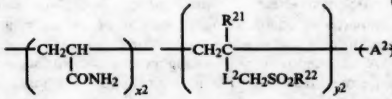
(1)



in which R^{11} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; Q^1 is —COO—, —CON(R^{11})—, or an arylene group containing 6–10 carbon atoms; L^1 is a divalent group containing at least one linkage selected from the group consisting of —COO— and —CON(R^{11})— and containing 3–15 carbon atoms, or a divalent group containing at least one linkage selected from the group consisting of —O—, —N(R^{11})—, —CO—, —SO—, —SO_2—, —SO_3—, —SO_2N(R^{11})—, —N(R^{11})CON(R^{11})— and —N(R^{11})COO—, and containing 1–12 carbon atoms, in which R^{11} has the same meaning as defined above; R^{12} is —CH=CH_2 or —$CH_2CH_2X^1$, in which X^1 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^1 by a base; A^1 is a divalent group derived from an ethylenic unsaturated monomer copolymerizable with monomers forming other unit portions; and x^1, y^1 and z^1 all representing molar percents range from 0 to 99, from 1 to 99, and from 1 to 99, respectively;

(2) a repeating unit having the formula (2):

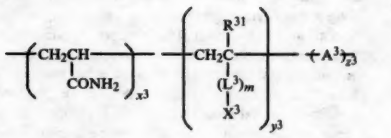
(2)



in which R^{21} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; R^{22} is —CH=CH_2 or —$CH_2CH_2X^2$, in which X^2 is a substituent replaceable with a nucleophilic group or releasable in the form of HX^2 by a base; L^2 is a divalent group selected from the group consisting of an alkylene group containing 1–6 carbon atoms, an arylene group containing 6–12 carbon atoms, —COZ^2—, and —COZ^2R^{23}—, in which R^{23} is an alkylene group containing 1–6 carbon atoms, or an arylene group containing 6–12 carbon atoms, and Z^2 is the oxygen atom or NH; A^2 is a divalent group derived from an ethylenic unsaturated monomer copolymerizable with monomers forming other unit portions; and x^2, y^2 and z^2 all representing molar percents range from 0 to 99, from 1 to 99, and from 1 to 99, respectively; and

(3) a repeating unit having the formula (3):

(3)



in which R^{31} is the hydrogen atom or an alkyl group containing 1–6 carbon atoms; L^3 is a divalent linkage group containing 1–20 carbon atoms; X^3 is an active ester; A^3 is a divalent group derived from an ethylenic unsaturated monomer copolymerizable with monomers forming other unit portions; and x^3, y^3 and z^3 all representing molar percents range from 0 to 99, from 1 to 99, and from 1 to 99, respectively; and m is 0 or 1; and

(III) a medium layer for electrophoresis comprising an aqueous polyacrylamide gel formed by crosslinking polymerization of an acrylamide compound, a crosslinking agent in the presence of water and a water-soluble polymer and agarose.

4,600,642

RADAR WAVE DIPOLE OF COPPER COATED CARBON FIBERS

Kevin J. Lodge, Synsham, Nr Brackley, and Jack Brettle, Towcester, both of England, assignors to Plessey Overseas Limited, Ilford, England

Continuation of Ser. No. 450,672, Dec. 17, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,136
Claims priority, application United Kingdom, Dec. 19, 1981, 8138348
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—367 **5 Claims**

1. A radar wave dipole for scattering radar radiation, the dipole comprising a carbon fibre having a diameter of around 7 μm and a bright smooth surface coating of copper, the coating having a thickness of less than 1 μm.

4,600,643

COMPOSITE YARN PRODUCT AND METHOD OF PREPARATION

Michaelene Dwulet, Lyndhurst, N.J., assignor to Multi-Tex Products Corp., Kearny, N.J.

Continuation-in-part of Ser. No. 547,696, Nov. 1, 1983, Pat. No. 4,533,597, which is a division of Ser. No. 362,717, Mar. 29, 1982, abandoned. This application May 28, 1985, Ser. No. 737,764
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—375 **11 Claims**

1. A composite yarn product comprising strands of a composite resinous laminate, said laminate having at least 3 film layers thereof, and consisting essentially of:

A. a central substrate comprising a colored non-cellulosic thermoplastic synthetic resinous material having two opposed surfaces;

B. an outer thermoplastic film adhered to each of said opposed surfaces;

C. an adhesive composition adhering said substrate to the

adjacent surfaces of said outer films, said adhesive composition applied to the adjacent surfaces of said outer films prior to the placement of said adjacent surfaces against the respective surfaces of said colored substrate, said adhesive composition consisting essentially of;

i. a first component, said first component comprising a resin material selected from copolymers of acrylonitrile and butadiene, and copolymers of butadiene and styrene, in an amount by weight of said adhesive composition of up to about 10%, and at least one organic solvent present in an amount by weight, based on said composition of about 10%; and

ii. a second component comprising a vinylchloride-vinylacetate copolymer, present in an amount by weight of from about 5% to about 10%, an epoxy resin present in an amount of about 5% by weight, and a solvent system for said second component present in an amount up to about 75% by weight of said adhesive composition;

iii. said first and said second components initially prepared individually, and said second component is dispersed in said first component; and

D. wherein the completed yarn product possesses an aggregate thickness of no greater than 2 mil.

4,600,644

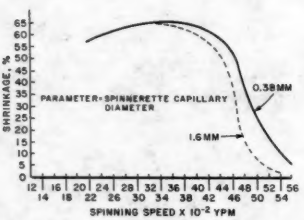
POLYESTER YARN, SELF-TEXTURING IN FABRIC FORM

James E. Bromley; John M. Chamberlin, and Jing-peir Yu, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 387,085, Jun. 10, 1982, abandoned. This application May 12, 1983, Ser. No. 492,091

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—399 **19 Claims**



1. A package of yarn, said yarn consisting essentially of a plurality of polyester filaments having average shrinkages differing by less than 5%, said yarn comprising a plurality of polyester filaments which vary aperiodically in shrinkage along their lengths, said aperiodic shrinkage variation resulting from use of a spinning speed within the range of from about 3300 to about 5000 meters per minute, said filaments having elongations between 50% and 130%, deniers less than 4.5 and non-round cross-sections with major-to-minor axis ratios of at least 1.2; the number of said filaments, the locations and amplitudes of the local shrinkage levels along the lengths of said filaments, and differences in local shrinkage levels between adjacent filament segments along said yarn being correlated such that said yarn is loop-forming.

4,600,645

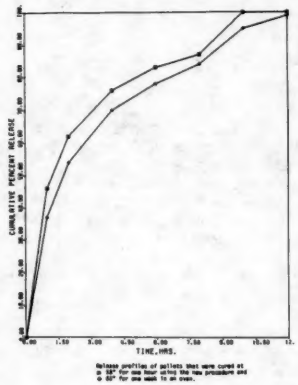
PROCESS FOR TREATING DOSAGE FORMS

Isaac Ghebre-Sellassie, Randolph; Robert H. Gordon, Dover; Michael R. Harris, Budd Lake, and Russell U. Nesbitt, Jr., Somerville, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 31, 1985, Ser. No. 696,955

Int. Cl.[4] A61K *9/00, 15/00, 21/00*

U.S. Cl. 428—403 **8 Claims**



1. A curing process for coated pharmaceutical dosage forms comprising the steps of:

(1) coating a drug-containing substrate with a sustained release formulation,

(2) immediately coating the product of step (1) with a water-soluble overcoat,

(3) drying the product of step (2) for about 15 to about 60 minutes, and

(4) recovering the coated dosage form.

4,600,646

METAL OXIDE STABILIZED CHROMATOGRAPHY PACKINGS

Richard W. Stout, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 15, 1984, Ser. No. 640,821

Int. Cl.[4] B32B *5/16, 6/04, 17/10*

U.S. Cl. 428—405 **15 Claims**

1. Surface-stabilized, porous silica bodies having uniform pore size and a particle diameter range of about 0.5–100 microns and having partial surface coverage of metal oxide in quantities insufficient to form a continuous layer over the silica but sufficient to effect an improvement in hydrolytic stability as compared to uncoated silica, thereby providing a surface mosaic of metal oxide and silicon oxide.

6. A chromatographic packing comprising surface-stabilized, porous silica bodies having uniform pore size and a particle diameter range of about 0.5–100 microns, having partial surface coverage of metal oxide in quantities insufficient to form a continuous surface layer over the silica but sufficient to effect an improvement in hydrolytic stability as compared to uncoated silica and having a covalently attached organosilane coating.

4,600,647

ULTRAVIOLET LIGHT STABILIZED POLYARYLATE CONTAINING ARTICLE

Lloyd M. Robeson, Whitehouse Station, N.J., and Claiborn L. Osborn, Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 26, 1984, Ser. No. 654,466
Int. Cl.[4] B32B *27/36;* C08L *67/02;* C08K *5/34*
U.S. Cl. 428—412 15 Claims

1. An ultraviolet light stabilized polyarylate containing article comprising an article made from a polyarylate coated with a solution of: (a) a substituted benzotriazole and a polymer, or (b) a substituted benzotrizole.

4,600,648

HOT-MELT ADHESIVE AS INTERMEDIATE LAYER OF A LAMINATE STRUCTURE

Jinichi Yazaki, Tokyo; Kozaburo Sakano, Kawasaki, and Junichi Matsuo, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Division of Ser. No. 507,915, Jun. 27, 1983, Pat. No. 4,585,985. This application Apr. 23, 1985, Ser. No. 726,366
Claims priority, application Japan, Feb. 15, 1983, 58-21989
Int. Cl.[4] B32B *27/08, 27/32, 27/36, 27/38*
U.S. Cl. 428—412 7 Claims

1. In a laminate structure comprising (1) at least one layer of an ethylene-vinyl alcohol copolymer, (2) at least one layer of a moisture-resistant resin composed of a polyolefin, a polyester or a polycarbonate, and (3) an adhesive layer interposed between the layer (1) and the layer (2), the improvement which comprises using as said adhesive layer a hot-melt composition comprising

(A)(i) an acid-modified olefin resin formed by graft modification of a trunk polymer comprising at least one olefin resin selected from the group consisting of low density polyethylene, medium density polyethylene, high density polyethylene, isotactic polypropylene, a propylene-ethylene copolymer, a propylene-butene-1 copolymer, a propylene-ethylene-butene-1 copolymer, an ethylene-vinyl acetate copolymer and an ion-crosslinked olefin copolymer, with an ethylenically unsaturated carboxylic acid or its anhydride or (ii) a resin mixture of said acid-modified olefin resin with an olefin resin selected from group providing said trunk polymer for said acid-modified olefin resin and

(B) an oxirane ring-containing compound selected from the group consisting of epoxidized glycerides, epoxidized fatty acid esters and epoxy hexahydrophthalic acid esters,

said composition including said acid- or acid anhydride-modified olefin resin in an amount sufficient to provide a carbonyl group concentration of 1 to 600 millimoles per 100 g of the composition and an oxirane oxygen concentration of 0.01 to 50 millimoles per 100 g of the composition.

4,600,649

ABRASION-RESISTANT ULTRAVIOLET-CURABLE COATINGS

A. Frank Leo, Palatine, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 22, 1984, Ser. No. 663,569
Int. Cl.[4] B05D *1/36*
U.S. Cl. 428—412 20 Claims

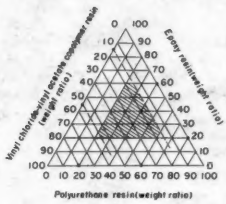
1. A radiation curable, liquid coating composition comprising from 70% to 85% of one or more polyacrylates or methacrylates containing at least 2.4 unsaturated groups per molecule, from 5% to 15% of a carboxylic acid which contains acrylic or methacrylic unsaturation, and at least one photoinitiator rendering the composition sensitive to ultraviolet light, said proportions being based on the total weight of polymerizable material.

4,600,650

MAGNETIC RECORDING MEDIUM

Akihiko Hosaka; Kiyotaka Okuyama, and Kiyoto Kanazawa, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,181
Claims priority, application Japan, Apr. 1, 1982, 57-55019
Int. Cl.[4] H01F *10/02*
U.S. Cl. 428—413 2 Claims



1. In a magnetic recording medium composed of a substrate coated with a magnetic layer comprising a magnetic powder and a binder, an improvement wherein the binder comprises from 20 to 60% by weight of a metal sulfonate group free polyurethane resin, from 20 to 60% by weight of an epoxy resin, from 15 to 55% by weight of a vinyl chloride-vinyl acetate copolymer resin and a polyisocyanate.

4,600,651

FLUOROELASTOMER LAMINATES

Carl A. Aufdermarsh, Houston, Tex.; Robert J. Harder, and Phillip P. Spiegelman, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 6, 1984, Ser. No. 637,781
Int. Cl.[4] B32B *25/20, 27/06*
U.S. Cl. 428—422 10 Claims

1. A laminate prepared from

(a) a first layer of peroxide curable elastomer composition of a terpolymer of tetrafluoroethylene, a perfluoroalkyl perfluorovinylether wherein the alkyl group contains 1 to 5 carbon atoms, and up to about 2 mole percent of units derived from an ethylenically unsaturated compound having a bromo- or iodo-substituent in an amount sufficient to provide at least about 0.1 mole percent bromine or iodine in the resulting terpolymer, and

(b) a second layer of peroxide curable elastomer composition of a polymer selected from the group consisting of

(1) copolymers prepared from monomers consisting essentially of tetrafluoroethylene, hexafluoropropylene, vinylidene fluoride and a bromo- or iodo cure site monomer;

(2) silicone elastomers and

(3) copolymers of tetrafluoroethylene and propylene, the laminate being co-cured and the first and second layers being directly bonded to each other.

4,600,652

PERMANENTLY BONDED ANTITHROMBOGENIC POLYURETHANE SURFACE

Donald D. Solomon, Spring Valley; Charles W. McGary, Centerville, and Vincent J. Pascarella, Dayton, all of Ohio, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 1, 1985, Ser. No. 718,664
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—423.3 7 Claims

1. An antithrombogenic polyurethane polymer, which comprises:

a. a support substrate;

b. a protonated amine rich polyurethane-urea bonded to said support substrate;

c. an aldehyde containing antithrombogenic agent reacted through the aldehyde group with the amine functionality of said polyurethane-urea to form a covalently bonded antithrombogenic material.

4,600,653

LAMINATED SAFETY GLASS

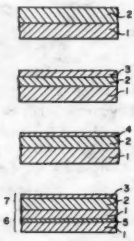
Hiroshi Washita, and Kaoru Oguro, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,997

Claims priority, application Japan, Jan. 27, 1984, 59-12003

Int. Cl.⁴ B32B *17/10, 27/40*

U.S. Cl. 428—425.6 **13 Claims**



1. A liminated safety glass having an at least two layered structure of an inorganic glass layer and a synthetic resin layer, said laminated structure having an exterior glass surface on one side and a synthetic resin surface on the other side, with the major portion of the synthetic resin layer comprising a polyurethane type thermoplastic resin being obtained by the reaction of a high-molecular weight diol composed of a combination of from 40 to 70% by weight of a poly-(1,6-hexylene 1 carbonate)diol having a molecular weight of from about 800 to about 4000 and from 30 to 60% by weight of a polyester diol having a molecular weight of from about 1500 to about 3000, said polyester diol being a compound or mixture of compounds having dihydric alcohol and dibasic carboxylic acid groups, residual ring opened cyclic ester groups or combinations thereof, with a non-yellowing type of diisocyanate compound in the presence of from about 1.0 to about 10.0 equivalents, relative to one equivalent of the total amount of diol reactant of a chain extender, as essential ingredients, said diisocyanate compound being present in an amount of from about 0.90 to about 1.15 equivalents, per one equivalent of the total amount of said diol and chain extender, and said diisocyanate not having isocyanate groups directly bonded to an aromatic ring in the event the diisocyanate compound contains an aromatic ring, and said chain extender being a diol having a molecular weight of at most 400 and a diamine.

4,600,654

METHOD OF PRODUCING TRANSPARENT, HAZE-FREE TIN OXIDE COATINGS

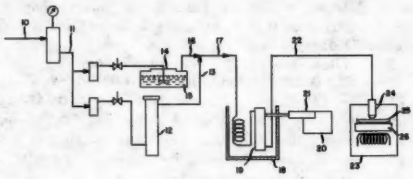
Georg H. Lindner, Vlissingen, Netherlands, assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed May 14, 1985, Ser. No. 733,997

Int. Cl.⁴ B05D *5/12*

U.S. Cl. 428—432 **14 Claims**

1. A method for producing a transparent, haze-free tin oxide coating by chemical vapor deposition which comprises vaporizing liquid monophenyltin trichloride and contacting said



vapor in an oxygen-containing atmosphere with a substrate at an elevated substrate temperature.

4,600,655

PLASTICIZED THERMOPLASTIC POLYVINYLBUTYRAL MOLDING COMPOSITIONS HAVING REDUCED ADHESION TO GLASS

Hans D. Hermann; Kurt Fock, both of Bad Soden am Taunus; Klaus Fabian, Kriftel, and Joachim Ebigt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,732

Claims priority, application Fed. Rep. of Germany, May 12, 1984, 3417653

Int. Cl.⁴ C08L *29/14;* **C08K** *5/14;* **C08J** *3/20;* **B32B** *17/06*

U.S. Cl. 428—437 **12 Claims**

1. A process for reducing adhesion to glass of a thermoplastic, plasticized polyvinylbutyral molding composition which comprises mixing constituents of the molding composition with a magnesium-salt non-stick agent and wherein the non-stick agent is a magnesium salt of a sulfonic acid, of a sulfuric acid halfester or of a mixture of such compounds.

4,600,656

ELECTROLESS METAL PLATING OF PLASTICS

Lawrence J. Krause, Chicago, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 420,054, Sep. 20, 1982, Pat. No. 4,459,330. This application Jun. 5, 1984, Ser. No. 617,654

Int. Cl.⁴ C23C *18/46*

U.S. Cl. 428—446 **6 Claims**

1. The product of an electroless plating process for plating at least one main group metal directly on a surface of a polymeric substrate comprising the steps of forming a nonaqueous solution containing a metallic salt of an alkali metal in a positive valence state and at least one main group metal in a negative valence state, the main group metal being selected from the group consisting of Ge, Sn, Pb, As, Sb, Bi, Si and Te, selecting an aromatic polymeric substrate reducible by the solublized salt and resistant to degration during the reaction, and carrying out a redox reaction between the salt in solution and the substrate by contacting the solution with the substrate for a sufficient time to oxidize and deposit the main group metal in elemental form to produce a plated substrate, the product being characterized by the plated metal being directly on the surface of the polymeric substrate and the alkali metal being retained in the plated substrate with the substrate being negatively charged with electrons transferred from the main group metal during the redox reaction.

4,600,657

PROTECTIVE COATINGS FOR ASPHALTIC CONCRETE SURFACES AND METHODS FOR FORMING THE SAME

Karl-Heinrich Wegehaupt; Rudolf Pusch, both of Burghausen, and Hans R. Pfeffer, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,377

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406266

Int. Cl.[4] B05D *3/02;* B32B *9/04, 11/00;* D06N *5/00*

U.S. Cl. 428—447 12 Claims

1. A method for coating asphaltic concrete which comprises applying a crosslinkable composition comprising a diorganopolysiloxane containing rod-shaped styrene-n-butyl acrylate copolymers which are obtained from the free-radical copolymerization of said monomers in the presence of the diorganopolysiloxane, and thereafter crosslinking the diorganopolysiloxane composition to form an elastomeric coating on the asphaltic concrete.

7. The coated asphaltic concrete obtained from the method of claim 1.

4,600,658

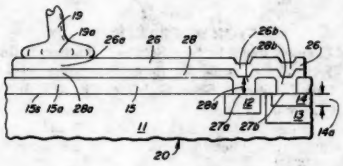
METALLIZATION MEANS AND METHOD FOR HIGH TEMPERATURE APPLICATIONS

George F. Anderson, Tempe, and Dan L. Burt, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 549,354, Nov. 7, 1983, Pat. No. 4,495,222. This application Sep. 20, 1984, Ser. No. 652,797

Int. Cl.[4] B32B *15/00, 9/06;* C25D *5/10, 5/26*

U.S. Cl. 428—450 7 Claims



1. A bonding pad for attachment of external bonding means, comprising:

a substrate of a material suitable for forming semiconductor devices;

an insulating layer overlying said substrate for supporting said bonding pad;

a polycrystalline silicon adhesion layer overlying and in contact with said insulating layer and of a material comprising an element in common with said insulating layer to promote chemical bonding thereto;

bonding layer overlying said adhesion layer and of a material adapted to readily form bonds to said external bonding means; and

a barrier layer intermediate between said bonding layer and said adhesion layer and of a material which forms intermetallic compounds with said adhesion layer to promote adhesion thereto and which prevents interdiffusion and alloying of said substrate material and said bonding layer material when interposed therebetween.

4. An electronic device having a bonding pad suitable for attachment to an external bonding means, comprising:

a bonding layer adapted to form bonds with said external bonding means;

an intermediate layer underlying and in contact with said bonding layer;

a polycrystalline silicon adhesion layer underlying and in contact with said intermediate layer;

an insulating layer underlying and in contact with said adhesion layer;

a semiconductor underlying said insulating layer;

wherein said insulating layer and said adhesion layer have compositions comprising the same element to promote chemical bonding therebetween;

wherein said intermediate layer is of a material suitable for use as barrier layer to prevent interdiffusion of said semiconductor and said bonding layer, and

wherein said adhesion layer and said intermediate layer bond together with a tensile strength at least equal to the tensile strength of said bonding layer.

4,600,659

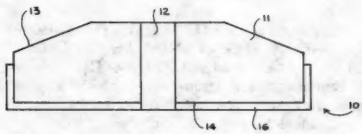
EMISSIVE COATING ON ALLOY X-RAY TUBE TARGET

Jauwhei Hong, New Berlin; Richard A. Jens, Milwaukee; Steve S. Shen, New Berlin, and Earle L. Manson, Jr., Brookfield, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 24, 1984, Ser. No. 643,981

Int. Cl.[4] B32B *9/00, 15/04;* B05D *5/06, 5/12*

U.S. Cl. 428—471 11 Claims



1. A thermal-emissive coating material on an anode target of an x-ray tube of the type having a cathode for directing the flow of electrons to a focal track portion of the anode target to produce x-rays said coating material comprising a fused application of a mixture comprising from 40 percent to 70 percent by weight of TiO_2 with the remaining portion of the mixture being a stabilized oxide primarily selected from the group consisting of ZrO_2, HfO, MgO, CeO_2, La_2O_2, and SrO, and also containing stabilizing material.

9. A method of applying a thermal-emissive coating to an anode target comprising the steps of:

applying to a surface of the target a coating mixture comprising from 40 percent to 70 percent by weight of TiO_2 and from 30 to 60 percent by weight of a stabilized oxide, and heating the target in a vacuum of at least 10^{-5} Torr to a temperature in the range of 1620° to 1700° C. for sufficient time to cause said coating to fuse to a smooth, glossy surface.

4,600,660

FOIL MATERIAL FOR THE STORAGE OF HYDROGEN

Karl-Heinz Klatt; Helmut Wenzl, both of Julich, and Paul Meuffels, Geilenkirchen, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 556,012

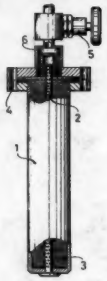
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313701

Int. Cl.[4] C01B *6/24;* B32B *15/00*

U.S. Cl. 428—607 8 Claims

1. A foil material for the storage of hydrogen in a hydrogen storageable material comprising a substrate; a hydrogen storageable metal forming a storage layer, a heat-transmissible adhesive layer for adhering said storage layer onto said substrate, said substrate being adapted for the absorption and production of reaction heat generated during hydrogen exchange, said hydrogen storageable metal being heat conduc-

tively applied onto said substrate through said heat-transmissible adhesive layer; and a protective layer which is oxidation-



inhibiting and hydrogen-permeable being applied onto said hydrogen storageable metal.

4,600,661

COMPOSITE MATERIAL WITH CARBON REINFORCING FIBERS AND MAGNESIUM ALLOY MATRIX INCLUDING ZINC

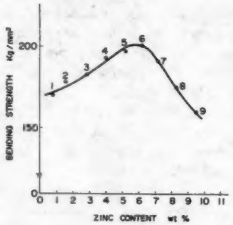
Tadashi Dohnomoto, and Atsuo Tanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 16, 1985, Ser. No. 723,756

Claims priority, application Japan, Jun. 15, 1984, 59-123392

Int. Cl.[4] B32B *5/02, 7/00*

U.S. Cl. 428—614 **6 Claims**



1. A composite material consisting essentially of:

(a) reinforcing carbon fibers; and

(b) a matrix metal which is an alloy containing from 2% to about 8% by weight of Zn, less than about 2% by weight of Zr, less than about 1% by weight of Al, with the balance being substantially Mg.

4,600,662

FERROUS ARTICLE LAYERED WITH ION VAPOR DEPOSITED NON-OXIDIZED ALUMINUM

Donald J. Broomfield, Elgin, Ill.; Paul C. Briggs, North Andover, Mass.; Eric G. Parker, Algonquin, and David P. Wagner, Geneva, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1985, Ser. No. 712,597

Int. Cl.[4] B21C *23/32*

U.S. Cl. 428—624 **4 Claims**

1. An article comprising a ferrous metal substrate, a layer of non-oxidized ion vapor deposited aluminum on said substrate, said layer of aluminum containing columnar voids, and a layer of coating material bonded to said non-oxidized plating material and substantially filling said voids.

4,600,663

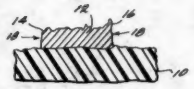
MICROSTRIP LINE

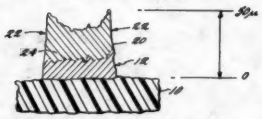
Brian T. Robertson, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Continuation of Ser. No. 395,336, Jul. 6, 1982, abandoned. This application Oct. 10, 1984, Ser. No. 659,503

Int. Cl.[4] C03C *27/02*

U.S. Cl. 428—632 **5 Claims**





1. A microstrip line comprising:

a substrate;

a first glass frit-bonded thick film copper conductive layer formed on said substrate; and

a second oxide-bonded thick film copper conductive layer formed on top of said first layer.

4,600,664

STORAGE BATTERY

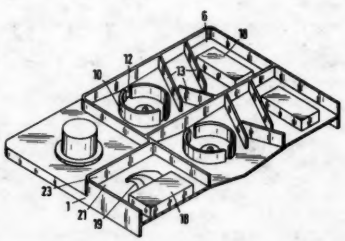
Wilhelm Cramer, and Manfred Schrewe, both of Brilon, Fed. Rep. of Germany, assignors to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany

Filed Sep. 27, 1985, Ser. No. 781,102

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1984, 8430246[U]

Int. Cl.[4] H01M *2/04, 2/12*

U.S. Cl. 429—7 **12 Claims**



1. A storage battery having a case closed-off by a block cover in which, for the purpose of separatingoff acid, a hollow space is formed by means of a lower cover part that is connected to said case, and an upper cover part that is spaced from said lower cover part; in conformity with the number of cells, the hollow space is divided into interconnected chambers, each of which communicates at its deepest location with an associated cell via an opening which is in the form of a tubular member;

the improvement wherein each of said tubular members comprises two separate tubular pieces which are coaxially disposed; one of said tubular pieces is provided on said lower cover part and extends away from said upper cover

part and into the associated cell; the other of said tubular pieces is provided on said upper cover part and extends toward said lower cover part into the associated chamber; the tubular piece of said upper cover part has a greater diameter than does the tubular piece of said lower cover part, with the tubular piece of said upper cover part being spaced from said lower cover part in such a way that space is left between said tubular piece of said upper cover part and said tubular piece of said lower cover part for the passage of gas and acid.

4,600,665

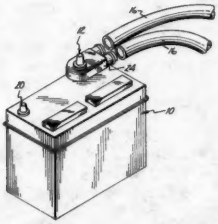
STORAGE BATTERY HEAT MAINTENANCE APPARATUS

Ronald J. Sanders, Anoka, Minn., assignor to Weather Ready Inc., Fridley, Minn.

Continuation-in-part of Ser. No. 642,580, Aug. 20, 1984, abandoned. This application Apr. 30, 1985, Ser. No. 728,792

Int. Cl.[4] H01M *10/50*

U.S. Cl. 429—120 **22 Claims**



1. Heat maintenance apparatus for storage battery having at least one terminal for removable interconnection with a battery cable comprising, in combination: an elongated adapter post having a generally cylinder-shaped outer surface; a circumferential groove formed in the outer surface of the adapter post defining a base and an upper rim on the elongated adapter post; an axially extending shoulder formed on the upper rim of the adapter post having a diameter smaller than that of the upper rim; means formed on the base of the adapter post for removably connecting the elongated adapter post to the terminal of the storage battery; means formed on the shoulder of the upper rim of the adapter post for removably connecting the battery cable to the elongated adapter post; means in surface contact with the outer surface of the elongated adapter post for applying heat to the adapter post, with the heat applying means being generally U-shaped and having a shape complementary to and for slideable receipt in the circumferential groove of the outer surface and intermediate the base and the upper rim of the elongated, cylinder-shaped, adapter post; a cap for receipt on the upper rim of the elongated adapter post; an aperture formed in the cap complementary to and for frictional receipt on the shoulder of the adapter post, with the cap having a size and shape complementary to recess the heat applying means after the heat applying means is slideably connected to the adapter post to prevent the heat applying means from sliding on the circumferential groove and with the battery cable preventing removal of the aperture of the cap from the shoulder of the adapter post, with the elongated adapter post being formed of a material having good thermal conductivity to provide a relatively good thermal conductivity path between the heat applying means and the thermal of the storage battery to elevate the temperature of the terminal of the storage battery above ambient air temperature.

4,600,666

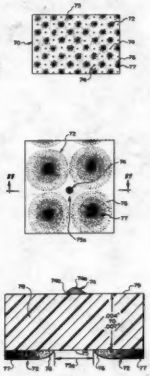
INTEGRATED PHOTOSCREEN FOR MAKING A HALFTONE REPRODUCTION PRINTING PLATE FROM A PHOTOGRAPH

Edmund S. Zink, 148 E. Harding, Des Plaines, Ill. 60016

Continuation-in-part of Ser. No. 457,422, Jan. 12, 1983, abandoned. This application Jan. 5, 1984, Ser. No. 568,489

Int. Cl.[4] G03F *9/00, 5/00*

U.S. Cl. 430—6 **40 Claims**



1. A method for making a halftone reproduction from a document, such as a photograph, having continuous tone areas, comprising the steps of: placing a document in a reproducing position relative to a reproducing apparatus; interposing between the document and reproducing means of the reproducing apparatus a transparent photoscreen comprising a sheet of transparent substrate material having an array of varying density, light modulating, light gray, vignetting dots which vary in density from a lightest density outer area to a darkest core density in the extreme center of the dot formed on one side of the sheet mixed with an array of light modulating white dots formed on the other side of the sheet and operating the reproducing apparatus to create a halftone reproduction of the document or photograph with said photoscreen serving to reduce the original document's continous tone density range.

4,600,667

PREPARATION OF PRINTING PLATE BY PATTERN EXPOSING BOTH SIDES OF CURABLE LIQUID RESIN

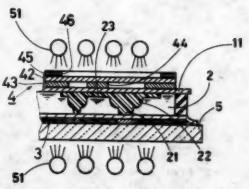
Seiichi Uchida, Moriguchi, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 11, 1985, Ser. No. 690,550

Claims priority, application Japan, Jul. 23, 1984, 59-154611; Nov. 6, 1984, 59-168182[U]

Int. Cl.[4] G03F *9/00, 7/26*

U.S. Cl. 430—22 **4 Claims**



1. A process for preparing a resin printing plate by forming a layer of liquid resin on a negative film having a transmitting

pattern, the liquid resin being curable by irradiation with activating rays, superposing on the liquid resin layer a transparent base film and a masking sheet formed with a transmitting pattern having a contour corresponding to and slightly larger than the transmitting pattern, irradiating the resin layer from below the negative film and above the masking sheet with activating rays to cure the resin layer and form a relief portion matching the transmitting pattern of the negative film, a mount portion supporting the relief portion and a base portion supporting the base part of the mount portion and joined to the base film, and removing the uncured liquid resin, the process being characterized in that the masking sheet is formed with a transmitting pattern having a contour corresponding to and slightly larger than the pattern of the negative film, a semi-transmitting pattern positioned outside the transmitting pattern and having a larger contour for transmitting the irradiating activating rays upon attenuation, and a blocking surface positioned outside the semi-transmitting pattern and having an effect to block the activating rays to an extent not to cure the liquid resin layer, the base portion formed on the base film by the irradiation with the activating rays being in match with the semi-transmitting pattern of the masking sheet, the base film being exposed outside the base portion.

4,600,668

ELECTROPHOTOGRAPHIC PROCESS

Toru Nakazawa, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 29, 1985, Ser. No. 738,981
Claims priority, application Japan, May, 1984, 59-109576
Int. Cl.[4] G03G *13/02*
U.S. Cl. 430—31 **5 Claims**

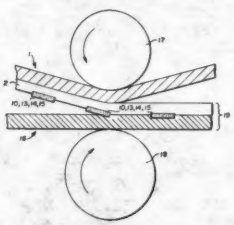
1. An electrophotographic process in which an image is formed by performing imagewise light exposure, toner development, toner image transfer and cleaning after charging a photoconductive photosensitive layer by direct current corona discharge, said process being characterized in that an organic photoconductive photosensitive layer in which the surface potential is saturated at 500 to 700 volts as the absolute value is used as the photosensitive layer and charging is carried out at an injection current which becomes saturated at said surface potential.

4,600,669

ELECTROPHOTOGRAPHIC COLOR PROOFING ELEMENT AND METHOD FOR USING THE SAME

Yee S. Ng, Fairport; Lawrence E. Contois; John D. Mitchell, both of Webster, and James D. Walling, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 686,509, Dec. 26, 1984, abandoned. This application Sep. 6, 1985, Ser. No. 773,528
Int. Cl.[4] G03G *13/01*
U.S. Cl. 430—47 **11 Claims**



1. A color proofing method comprising:

(I) forming a first color separation image on the dielectric support of an electrophotographic proofing element comprising,

(a) a photoconductive layer on an electrically conductive substrate capable of transmitting actinic radiation to which the photoconductive layer is responsive, and

(b) a releasable dielectric support comprising the photoconductive layer or an overcoat thereof, forming a surface of the element capable of holding an applied electrostatic charge, by

(i) overall charging the surface of the dielectric support,

(ii) imagewise-exposing the photoconductive layer to actinic radiation to form a first electrostatic image on the surface of the dielectric support,

(iii) developing the first electrostatic image with a first color developer composition to form the first color separation image,

(II) forming a second color separation image over the first color separation image on the surface of the dielectric support by

(iv) overall charging the surface of the dielectric support and first color separation image,

(v) while the dielectric support and first color separation image are still charged, imagewise-exposing the photoconductive layer to actinic radiation through the substrate to form a second electrostatic image, and

(vi) developing the second electrostatic image with a second color developer composition to form the second color separation image, and

(III) contacting the surface of the dielectric support having said color separation images thereon with a receiving element, and

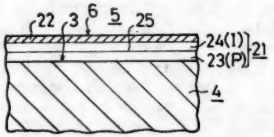
(IV) transferring the dielectric support and color separation images to the receiving element to form a multicolor proof.

4,600,670

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 502,583, Jun. 9, 1983, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Mar. 23, 1984, Ser. No. 594,292
Claims priority, application Japan, Jun. 25, 1980, 55-86801
Int. Cl.[4] G03G *5/082, 5/14*
U.S. Cl. 430—57 **6 Claims**



1. A printing member for electrostatic photocopying consisting essentially of:

a substrate having a conductive surface; and a photoelectrically-sensitive, electrically chargeable layer on the conductive surface of the substrate;

wherein the photoelectrically-sensitive, electrically chargeable layer has a non-single-crystalline semiconductor layer on the conductive surface of the substrate and a chargeable layer formed on the non-single-crystalline semiconductor layer;

wherein the non-single-crystalline semiconductor layer has a first layer on the side of the substrate and a second layer on the first layer to create a transition region;

wherein the first layer is P or N type and is formed principally of Si, $Si_3N_{4-x}(0<x<4)$, $SiC_{1-x}(0<x<1)$, or $SiO_{2-x}(0<x<2)$ and contains hydrogen, flourine or chlorine, the second layer is I type and is formed principally of $SiO_{2-x}(0<_x<2)$ and contains hydrogen, fluorine or chlorine, and the transistion region is PI or NI type depending on whether the first layer is P or N type; and

wherein the energy band gap of the second layer is less than the energy band gap of the chargeable layer;

wherein the chargeable layer is formed principally of $SiO_{1-x}(0<x<2)$, $Si_3N_{4-x}(0<x<4)$ or $SiC_{1-x}(0<x<1)$.

4,600,671

PHOTOCONDUCTIVE MEMBER HAVING LIGHT RECEIVING LAYER OF A-(SI-GE) AND N

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1984, Ser. No. 648,267

Claims priority, application Japan, Sep. 12, 1983, 58-168545; Sep. 13, 1983, 58-170381; Dec. 27, 1983, 58-244736; Dec. 27, 1983, 58-244740; Dec. 28, 1983, 58-245303; Dec. 28, 1983, 58-245315

Int. Cl.[4] G03G 5/082

U.S. Cl. 430—57 166 Claims

1. A photoconductive member which comprises a substrate for the photoconductive member and a light receiving layer exhibiting photoconductivity provided on said substrate comprising an amorphous material containing silicon atoms, germanium atoms and from 0.01 to 40 atomic percent of at least one of hydrogen atoms and halogen atoms, the light receiving layer having a layer region (N) containing nitrogen atoms, and the layer region (N) having a region (X) in which the content C (N) of nitrogen atoms in the layer thickness direction smoothly and continuously increases toward the upper surface of the light receiving layer, wherein the maximum value Cmax of the content C(N) of nitrogen atoms exists at one end surface of layer region (N).

4,600,672

ELECTROPHOTOGRAPHIC ELEMENT HAVING AN AMORPHOUS SILICON PHOTOCONDUCTOR

Itaru Fujimura, Numazu; Yukio Ide, Mishima; Yoshiyuki Kageyama, Numazu, and Masako Kunita, Fuji, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,566

Claims priority, application Japan, Dec. 28, 1983, 58-250200

Int. Cl.[4] G03G 5/085

U.S. Cl. 430—64 7 Claims

1. An electrophotographic element consisting essentially of an electrically conductive substrate, an intermediate layer on said substrate and in face-to-face contact therewith, and a photosensitive layer on said intermediate layer and in face-to-face contact therewith, said intermediate layer having a thickness in the range of from 500 Angstrom units to 1 micrometer and said photosensitive layer having a thickness in the range of from 10 to 40 micrometers, said intermediate layer and said photosensitive layer being made of compositions consisting essentially of amorphous silicon containing from 0.5 to 30 atomic % at least one member selected from the first group consisting of nitrogen, oxygen and carbon and from 5 to 40 atomic % of at least one member selected from the second group consisting of hydrogen and fluorine, said photosensitive layer and said intermediate layer having different compositions so that said intermediate layer exhibits either (a) p-type semiconduction or (b) n-type semiconduction, and said photosensitive layer exhibits either (1) intrinsic conduction, or (2) the other of (a) or (b), whereby the majority of the charge carriers that become present in the intermediate layer are of the same polarity as the charge carriers that are injected from said substrate into said intermediate layer at the time that said photosensitive layer is uniformly charged during the electrophotography process and, when the charged electrophotographic element is imagewise exposed, the charge on the surface of said photosensitive layer is neutralized in the exposed areas by combination of the charge carriers of opposite polarity at the interface between said intermediate layer and said photosensitive layer.

4,600,673

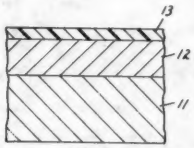
SILICONE RELEASE COATINGS FOR EFFICIENT TONER TRANSFER

William A. Hendrickson, New Brighton; Jack L. Evans, St. Paul; Kenneth R. Paulson, North St. Paul, and Robert W. Wilson, Falcon Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 520,208, Aug. 4, 1983, abandoned. This application Apr. 22, 1985, Ser. No. 725,511

Int. Cl.[4] G03G 5/14

U.S. Cl. 430—66 14 Claims



1. A photoconductive assembly comprising an electroconductive substrate, a layer of photoconductive material, and a topcoat comprised of a cured silicone polymer having a dry thickness from 12.5 nm to 70 nm and which is capable of being formed by applying to the photoconductive layer at a wet coating thickness of 9 micrometers a solution comprising from 0.25 to 1.0 parts by weight of a curable silicone polymer in at least one organic non-polar solvent and drying said solution thereon to form said cured silicone top coat, which cured silicone top coat has a melting point above 100° C.

4,600,674

TRISAZO ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE MATERIAL

Kazuhiro Emoto, and Akira Itoh, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

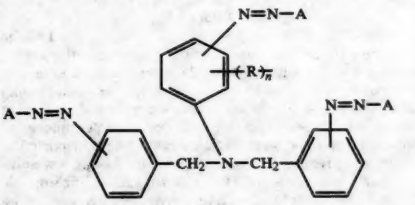
Filed Jun. 24, 1985, Ser. No. 748,398

Claims priority, application Japan, Jun. 21, 1984, 59-132206; Jul. 10, 1984, 59-143736

Int. Cl.[4] G03G 5/06

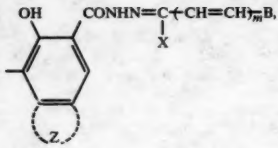
U.S. Cl. 430—72 3 Claims

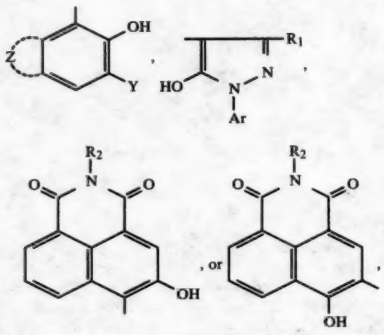
1. An electrophotographic photoconductive material comprising an electroconductive substrate and, provided thereon, a photosensitive layer containing a trisazo pigment represented by the general formula



[I]

wherein R's, which may be the same or different, are each a hydrogen atom, halogen atom, substituted or unsubstituted alkyl group, alkoxyl group, or nitrile group; n is an integer of 1 or 2; and A is





wherein Z is a group of atoms necessary to complete a substituted or unsubstituted aromatic carbon ring or a substituted or unsubstituted aromatic hetero-ring; X is a hydrogen atom, an alkyl group, or a group of atoms necessary to complete a substituted or unsubstituted aromatic carbon ring, a substituted or unsubstituted aromatic hetero ring, or a substituted or unsubstituted hetero ring; m is 0 or 1; B is a group of atoms necessary to complete a substituted or unsubstituted aromatic carbon ring, a substituted or unsubstituted aromatic hetero ring, or a substituted or unsubstituted monocyclic hetero ring; Y is a hydrogen atom, hydroxyl group, carboxyl group or an ester thereof, sulfo group, substituted or unsubstituted carbamoyl group, or substituted or unsubstituted sulfamoyl group; R_1 represents a hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted amino group, substituted or unsubstituted carbamoyl group, carboxyl group or an ester thereof, or cyano group; Ar is a substituted or unsubstituted aryl group; and R_2 is a substituted or unsubstituted alkyl group, substituted or unsubstituted aralkyl group, or substituted or unsubstituted aryl group.

4,600,675

MAGNETIC CARRIER FOR ELECTROSTATIC LATENT IMAGE DEVELOPMENT

Eiji Iwasa, Takarazuka, and Noboru Ito, Amagasaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 31, 1984, Ser. No. 688,143
Claims priority, application Japan, Jan. 11, 1984, 59-4186
Int. Cl.[4] G03G *9/14*
U.S. Cl. 430—106.6 **1 Claim**

1. A magnetic carrier suitable for use in an electrographic developing method which effects development of an electrostatic latent image with a magnetic developer at a developing region by rotating a developing sleeve incorporating a magnet therein, thereby causing said magnetic developer, composed of an insulating toner and a magnetic carrier, to be transported to said developing region, said magnetic carrier having a weight-average particle diameter of 35 to 100 μm and comprising 350 to 800 parts by weight of a fine ferrite powder having an electric resistance of at least 10^7 Ω.cm, and 100 parts by weight of a binder resin having a hydrophilic functional group in an amount such that the acid value or OH value of the binder resin is in the range of 5 to 250 mg KOH/g, said magnetic carrier possessing the following properties: (1) magnetization of 2000 to 3000 gausses in a magnetic field of 1000 oersteds, (2) coercive force of 60 to 250 oersteds, and (3) electric resistance of at least 10^{12} Ω.cm.

4,600,676

TONER COMPOSITION CONTAINING TITANATE COUPLING AGENT FOR ELECTROPHOTOGRAPHY AND METHOD FOR PRODUCING SAID TONER

Sadatugu Terada; Kiyoshi Tamaki; Hideki Murata; Akitoshi Matsubara, all of c/o Konishiroku Photo Ind. Co., Ltd., 1,, Sakura-machi, Hino-shi, Tokyo; Tsuneo Wada, and Hiroyuki Takagiwa, both of c/o Konishiroku Photo Ind. Co., Ltd., 2970 Ishikawa-cho, Hachioji-shi, Tokyo, all of Japan

Continuation of Ser. No. 496,672, May 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 312,395, Oct. 19, 1981, abandoned. This application Aug. 15, 1984, Ser. No. 641,348
Claims priority, application Japan, Nov. 10, 1980, 55-156911
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—106.6 **17 Claims**

1. A toner composition for electrophotography, comprising particles having a diameter of up to 50 microns, said particles comprising a vinyl polymer obtained by polymerizing a vinyl monomer in the presence of (i) a titanate coupling agent, and (ii) at least one inorganic material.

4,600,677

ORGANOALKOXYSILANE CARRIER COATINGS

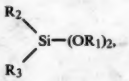
Thomas R. Hoffend, Webster, and Joseph Mammino, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 357,966
Int. Cl.[4] G03G *9/10, 9/14*
U.S. Cl. 430—108 **22 Claims**

1. An electrostatographic composition consisting essentially of toner particles and carrier particles, the carrier particles consisting essentially of a core, containing from about 0.004 weight percent to about 10 weight percent of a polymerized organoalkoxysilane coating, wherein the monomers to be polymerized are selected from the group consisting of organoalkoxy silane monomers of the following formulas:

$$R—Si—(OR_1)_3,$$

and



wherein R_1 is an alkyl group containing from about 1 to about 6 carbon atoms, R, R_2, and R_3, are independently selected from the group consisting of alkyl groups, substituted alkyl groups, aromatic groups, and substituted aromatic groups, and wherein the toner particles consisting essentially of resin particles and pigment particles, whereby there results carrier particles possessing positive or negative triboelectric values, which values are from about 5 microcoloumbs per gram to about 40 microcoloumbs per gram.

4,600,678

IMAGING SYSTEMS EMPLOYING PHOTOSENSITIVE MICROCAPSULES CONTAINING 4-(4'-AMINOPHENYL)-PYRIDINE COMPOUNDS

Paul C. Adair, and Amy L. Burkholder, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Aug. 3, 1984, Ser. No. 637,258
Int. Cl.[4] G03C *1/00, 1/40, 1/72, 5/00*
U.S. Cl. 430—138 8 Claims

1. An imaging sheet comprising a support having on a surface thereof a layer containing photosensitive microcapsules, said microcapsules including in the internal phase thereof a free radical addition polymerizable material, a photoinitiator, and a color former, wherein said photoinitiator is capable of generating free radicals upon exposure to actinic radiation via hydrogen abstraction and said color former is a 4-(4'-aminophenyl)-pyridine compound which enhances the film speed of said imaging sheet.

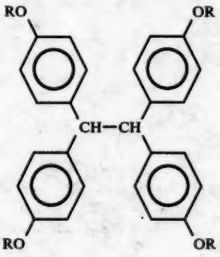
4,600,679

WATER-DEVELOPABLE, NEGATIVE-WORKING, DIAZO LITHOGRAPHIC PRINTING PLATE WITH OLEOPHILIC ESTER OVERLAYER

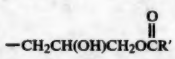
Alan R. Browne, Columbia, and Charles R. Morgan, Brookeville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 25, 1984, Ser. No. 613,823
Int. Cl.[4] G03C *1/60;* G03F *7/08*
U.S. Cl. 430—162 2 Claims

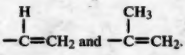
1. A negative-working, tap water-developable, bi-layer lithographic printing plate comprising a substrate having a hydrophilic surface which is first coated with a layer of a water-soluble, lithographically suitable, photosensitive, negative-working aromatic diazo composition and top coated with a layer consisting of a water-permeable, water-insoluble, oleophilic ester derivative of an O-epoxyalkylated tetrakis (hydroxyphenyl) ethane resin of the formula:



wherein R is



wherein R' is alkyl containing 1 to 14 carbon atoms, aryl containing 6 to 14 carbon atoms, aralkyl containing 6 to 14 carbon atoms,

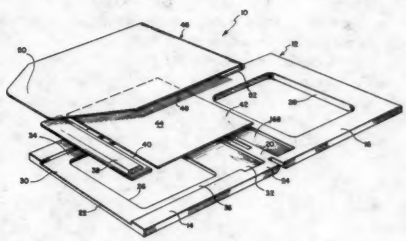


4,600,680

TRANSPARENCY FILM ASSEMBLAGE

Peter K. Fichter, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 1, 1985, Ser. No. 718,641
Int. Cl.[4] G03C *5/54;* G03D *9/02*
U.S. Cl. 430—207 9 Claims



1. A transparency film assemblage, comprising:

a mount including first and second sections, said first section including first and seconed ends separated by means for defining a first aperture, and said second section including means for defining a second aperture;

a rupturable container of processing liquid having a discharge end positioned adjacent said first end of said first section;

an unexposed transparency film frame of the instant type secured to said first section in superposition to said first aperture with an end of said film frame positioned to receive upon a major surface thereof said processing liquid when expressed from said end of said rupturable container, said transparency film frame includes a strippable photosensitive layer;

a sheet of material adapted to be located in superposed relation to said film frame, said sheet being constructed to assist in the spreading of said processing liquid across said major surface of said film frame, subsequent to its photographic exposure, so as to initiate the formation of a visible image in said transparency film frame, said sheet also being adapted to strip said photosensitive layer from said transparency film frame subsequent to the formation of the visible image; and

means connecting said second end of said first section to said second section for movement of said second section from a first position, wherein said sheet together with said photosensitive layer may be stripped from superposed relation with an area of said film frame which is to be subsequently viewed, to a second position, wherein said first and second sections are folded upon each other with said sheet and said photosensitive layer located therebetween and with said first and second apertures located in alignment with each other and with said film frame sandwiched therebetween whereby said transparency film assemblage is in condition to be placed within a projector for subsequent viewing of the uncovered area of said film frame.

4,600,681
COLOR PHOTOGRAPHIC MATERIAL WITH AZO DICYANOIMIDAZOLE DYES

Peter Bergthaller, Bergisch Gladbach, Fed. Rep. of Germany; Jürgen Strauss, Melba, Australia; Hans-Volker Runzheimer, Elkhart, Ind., and Gerhard Wolfrum, Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1985, Ser. No. 748,837

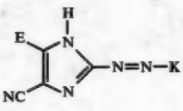
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424899

Int. Cl.[4] G03C *1/40, 5/54*

U.S. Cl. 430—242 **2 Claims**

2. The method of producing an image by dye diffusion processing of an image-wise exposed color photographic material containing associated with at least one sensitive silver halide emulsion layer, a non-diffusible dye color providing compound while in contact with an image receptor layer,

the method comprising the step of releasing from said non-diffusible dye color providing compound under alkaline development conditions an image dye comprising the azo dye corresponding to the following general formula



wherein

E represents an electron acceptor radical selected from the group consisting of cyano, and carboxy, or carbamoyl hydrolysis derivatives of cyano; and

K represents the radical of an azo coupling component, which is derived from an open-chain or closed ring keto-methylene compound, a cyclic enamine compound or a phenolic compound.

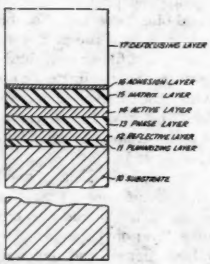
4,600,682
OPTICAL STORAGE STRUCTURE

Fred W. Spong; Boris J. Muchnik, and Franklin D. Kalk, all of Boulder, Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jul. 6, 1984, Ser. No. 628,194

Int. Cl.[4] G11B *7/24*

U.S. Cl. 430—270 **9 Claims**



1. A radiation recording structure for use in an information storage device having focused write and read radiation beams, said recording structure comprising:

(a) a substrate supported reflective layer;

(b) a three-layer structure on said reflected layer comprising a tuned phase layer, an active globular layer and a matrix layer, in that order, said matrix and phase layers being substantially transparent to said radiation beams;

(c) a dust defocusing layer for defocusing the image of dust on said dust defocusing layer; and

(d) an aluminum adhesion layer adhering said dust defocusing layer to said matrix layer, said adhesion layer being substantially transparent to said radiation beams.

9. An optical recording structure for use in an information storage device having focused write and read radiation beams, said recording structure comprising:

(a) a disk-shaped substrate for providing support for the recording structure;

(b) a planarizing layer on said substrate for providing an optically flat surface;

(c) a reflective layer deposited on said planarizing layer;

(d) a three-layer structure comprised of a fluorocarbon phase layer on said reflective layer, an active layer on said phase layer, and a fluorocarbon matrix layer on said active layer, whereby said active layer is encapsulated between said phase layer and matrix layer, said active layer comprising globules of a tellurium, selenium and arsenic alloy;

(e) a metallic aluminum adhesion layer on said matrix layer; and

(f) a dust defocusing layer on said adhesion layer,

said adhesion layer and dust defocusing layer being optically transparent to said read and write beams, said adhesion layer bonding said dust defocusing layer to said matrix layer.

4,600,683
CROSS-LINKED POLYALKENYL PHENOL BASED PHOTORESIST COMPOSITIONS

Stephen E. Greco, Beacon, and Dennis C. Green, Hopewell Junction, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,587

Int. Cl.[4] G03C *1/495, 1/52, 1/72*

U.S. Cl. 430—270 **20 Claims**

1. A process for the production of a resist image which comprises depositing a layer on a substrate, the layer comprised of a photosensitizer and a polyalkenyl phenol cross-linked with a polyfunctional cross-linking compound, exposing the layer patternwise to radiation and then developing the pattern-exposed layer.

12. A film forming, radiation sensitive photoresist composition comprised of a photosensitizer and a polyalkenyl phenol cross-linked with a polyfunctional cross-linking agent.

4,600,684
PROCESS FOR FORMING A NEGATIVE RESIST USING HIGH ENERGY BEAM

Yoshio Yamashita, and Ryuji Kawazu, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,363

Claims priority, application Japan, Feb. 10, 1983, 58-19582; Mar. 31, 1983, 58-53674

Int. Cl.[4] G03F *7/26*

U.S. Cl. 430—296 **2 Claims**

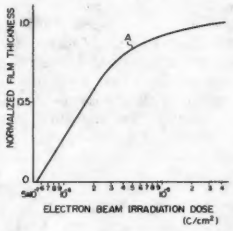
1. A process for forming a pattern on a high energy beam negative type resist comprising the steps of forming a film of a negative type resist consisting essentially of a quinone diazide sulfonic ester of a novolak resin having a polymerization degree of 1–10 on a substrate, selectively irradiating said film with a high energy beam from the group consisting of electron beam and X-ray radiation, and developing the film thus irradiated by using an organic solvent which is an alkyl ketone or an acetic ester to remove portions of the film which have not been selectively irradiated.

4,600,685

PATTERNING PROCESS USING LADDER-TYPE ORGANOSILOXANE RESIN AND PROCESS FOR PRODUCTION OF ELECTRONIC DEVICES UTILIZING SAID PATTERNING PROCESS

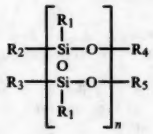
Toshisuke Kitakohji, Machida; Shiro Takeda, Sagamihara; Minoru Nakajima, Kawasaki, and Hiroshi Tokunaga, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 545,601, Oct. 27, 1983, abandoned, which is a continuation of Ser. No. 305,784, Sep. 25, 1981, abandoned. This application May 29, 1985, Ser. No. 738,891
Claims priority, application Japan, Sep. 27, 1980, 55-134542
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—313 15 Claims



1. A process comprising the steps of:

coating a substrate with a ladder-type organosiloxane resin represented by the general formula:



wherein: each R_1 is independently selected from alkyl groups having 1 to 6 carbon atoms, and phenyl and halophenyl groups; R_2 and R_3 are indpendently selected from alkoxy groups having 1 to 3 carbon atoms, a hydroxyl group and alkyl groups having 1 to 3 carbon atoms; R_4 and R_5 are independently selected from hydrogen and alkyl groups having 1 to 3 carbon atoms; and n is a number giving a weight average molecular weight of about 1,000 to 1,000,000 to the ladder-type organosiloxane resin, said ladder-type organosiloxane resin having a dispersivity of from about 1.5 to about 4;

directly irradiating the coated organosiloxane resin with energy rays according to a desired pattern;

subjecting the irradiated coated organosiloxane resin to a development treatment to remove the non-irradiated portion of the resin to form a mask of said ladder-type resin with said desired pattern;

after forming said mask, heating said mask at a temperature of from 200° to 500° C. in an inert gas atmosphere, wherein said mask after said heating comprises said ladder-type resin;

using said mask to etch a respective exposed part of said substrate;

leaving at least a portion of said mask permanently on said substrate as an insulating layer; and

heating said portion of said mask remaining as said insulating layer to a temperature of at least 450° C.;

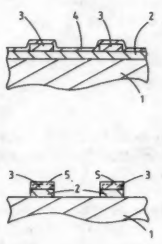
wherein said insulating layer after said heating, has said ladder-type structure and is provided with a low weight loss characteristic for a temperature of up to approximately 700° C.

4,600,686

METHOD OF FORMING A RESIST MASK RESISTANT TO PLASMA ETCHING

Joseph Meyer, Redhill, and David J. Vinton, Burgess Hill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1983, Ser. No. 496,701
Claims priority, application United Kingdom, May 26, 1982, 8215431
Int. Cl.[4] G03C 5/00
U.S. Cl. 430—326 9 Claims



1. A method of forming a plasma resistant mask on a substrate comprising the steps of

forming a layer of radiation sensitive resist on a substrate,

lithographically patterning said layer to form a patterned radiation sensitive resist layer,

providing a layer of coating material of chromium on said patterned layer and said substrate,

effecting a heat treatment of said coating layer such that said coating layer in contact with said resist layer chemically reacts to form a plasma etch resistant skin on said patterned resist layer, and

removing unreacted portions of said coating layer to form said patterned resist layer with a skin coating of said coating layer as said mask on said substrate, wherein said patterned resist layer is formed on a surface layer of said substrate, said surface layer including the same material as said layer of coating material.

2. A method according to claim 1, wherein said radiation sensitive resist is positive acting.

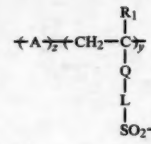
4,600,687

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Taku Nakamura; Mitsunori Hirano; Masasi Ogawa, and Kunio Ishigaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

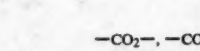
Continuation of Ser. No. 251,827, Apr. 7, 1981, abandoned. This application Apr. 22, 1985, Ser. No. 725,684
Claims priority, application Japan, Apr. 7, 1980, 55-45412
Int. Cl.[4] G03C 1/76, 1/86
U.S. Cl. 430—529 16 Claims

1. A photographic element having at least one light-sensitive silver halide emulsion layer, said element having at least one layer containing gelatin and a polymer which is a gelatin hardener, the polymer having a repeating unit of the formula (I):

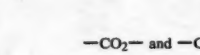


(I)

wherein A is a monomer unit prepared by copolymerizing copolymerizable ethylenically unsaturated monomers; R_1 is hydrogen or a lower alkyl group having 1 to 6 carbon atoms; Q is



(wherein R_1 is the same as defined above)
or a phenylene group; L is a divalent group having 3 to 15 carbon atoms and containing at least one linking group selected from the members consisting of



(wherein R_1 is the same as defined above) or a divalent group having 1 to 12 carbon atoms and containing at least one linking group of SO_2; R_2 is $-CH=CH_2$ or $-CH_2CH_2X$ (wherein X is a group capable of being substituted with a nucleophilic group or a group capable of being released in the form of HX upon reaction with a base); and z and y each represents molar percent, z being between 0 and 75 and y being between 25 and 100.

4,600,688

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Satoshi Kawakatsu; Noritaka Nakayama; Katsunori Katoh, all of Hachioji; Kaoru Shinozaki, Tachikawa, and Toshihiko Kimura, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Feb. 8, 1985, Ser. No. 699,958

Claims priority, application Japan, Feb. 10, 1984, 59-24653

Int. Cl.[4] G03C *7/26, 7/32*

U.S. Cl. 430—558 **12 Claims**

1. In a silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer,

said silver halide color photographic light-sensitive material wherein said at least one silver halide emulsion layer comprises a 1H-pyrazolo[3,2-C]-s-triazole-type magenta coupler, and said silver halide emulsion layer containing said magenta coupler and/or a silver halide emulsion layer having substantially the same color sensitivity as said silver halide emulsion layer containing said magenta coupler comprises a pyrazolone-type magenta coupler.

4,600,689

NOVEL BILIRUBIN OXIDASE, ITS PRODUCTION AND USE

Susumu Matsui, Ootsu; Yoshio Yoshihama, and Tsutomu Taniguchi, both of Kyoto, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Sep. 10, 1984, Ser. No. 649,054

Claims priority, application Japan, Nov. 21, 1983, 58-218895; May 24, 1984, 59-105604

Int. Cl.[4] C12Q *1/26;* **C12N** *9/02;* **C12R** *1/645*

U.S. Cl. 435—25 **11 Claims**

1. A bilirubin oxidase M-1 having the following physicochemical properties:

(1) Action: Has an action to oxidize bilirubin in the presence of oxygen far into an almost colorless substance through biliverdin and then a pale violet substance, but forms no hydrogen peroxide;

(2) Substrate specificity: Acts on bilirubin and to some degree on biliverdin as well as on phenol, catechol and hydroquinone;

(3) Optimum pH and pH stability: Has an optimum pH in the vicinity of 5.5, and is stable between pH 5 and pH 9 for 60 minutes treatment at 37° C.

(4) Optimum temperature and thermal stability: Has an optimum temperature in the vicinity of 50° C. and is stable up 55° C. for 10 minutes treatment at a pH of 7.0;

(5) Molecular weight: About 83,000 (gel filtration method);

(6) Isoelectric point: 3.92 ± 0.05;

(7) Interfering agent: Inhibited by sodium azide, L-ascorbic acid, dithiothreitol and potassium cyanide;

(8) Visible absorption spectrum: Has an absorption maximum in the vicinity of 610 nm;

(9) Sugar content: Contains about 4.5% of sugar;

(10) Copper content: Contains 4 moles of copper per mole.

4. A method for the quantitative determination of bilirubin wherein a reagent composition for bilirubin containing the bilirubin oxidase M-1 of claim 1 is caused to act on a bilirubin-containing test solution and a change in bilirubin caused thereby is measured colorimetrically.

4,600,690

IMMUNOASSAY

Arthur Karmen, Manhasset, and Fred D. Lasky, Ardsley, both of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, A division of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 931,501, Aug. 7, 1978, abandoned. This application Jul. 19, 1983, Ser. No. 515,286

Int. Cl.[4] G01N *33/53, 33/557, 33/534*

U.S. Cl. 435—7 **5 Claims**

1. A method for performing an immunoassay to determine the presence and quantity of a compound in a solution, comprising the steps of:

(a) adding to the solution a binding reagent capable of binding to the compound being assayed, the binding reagent to be added in a quantity greater than that necessary to react with all of the compound, and adding to the solution a known quantity of a labeled ligand, the labeled ligand being composed of the same compound as that being assayed covalently bound to a label, said labeled ligand binding to the binding reagent more slowly than the compound binds to the binding reagent, the known quantity of labeled ligand being less than that necessary to saturate the binding capacity of the binding reagent, and the labeled ligand having a distinctive property which can be detected;

(b) adding to the solution after a predetermined time period following the addition of the labeled ligand to the solution, a quantity of the same compound as that being assayed, the quantity being greater than that necessary to saturate the binding capacity of the binding reagent so as to stop effectively further reaction of the binding reagent with the labeled ligand, thereby permitting an assay of the proportion of the labeled ligand which is bound to the binding reagent, the predetermined time period being such that a reaction between the labeled ligand and the binding reagent is not completed or the reaction does not reach equilibrium;

(c) determining the proportion of the labeled ligand which is free in the solution or the proportion of the labeled ligand which is bound to the binding reagent by assaying for the presence of the distinctive property on the binding reagent or the absence of the distinctive property from the solution;

(d) identifying the quantity of the compound being assayed originally in the solution by comparing the proportion of bound or free labeled ligand, which is directly related to

the quantity of the compound originally present in the solution, with a standard curve prepared by assaying, in accordance with steps (a) through (c), samples containing known quantities of the compound dissolved in a substrate similar to the solution.

4,600,691

R-(Z)-4-AMINO-3-CHLORO-2-PENTENEDIOIC ACID, NOVEL ANTIBACTERIAL AGENT

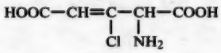
Louis Chaiet, Springfield; Richard L. Monaghan, Somerset; Sheldon B. Zimmerman, Springfield, all of N.J., and Maria I. M. Fernandez, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 541,174, Oct. 12, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 719,607

Int. Cl.[4] C12P *13/04, 17/10;* **C12R** *1/465*

U.S. Cl. 435—106 **3 Claims**

1. A method of preparing a compound of the formula



and a pharmaceutically acceptable salt thereof which comprises cultivating *Streptomyces viridogenes* MA5450, ATCC 39387 in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic conditions and recovering said compound.

4,600,692

IMMOBILIZED CELLS FOR PREPARING PHENYLALANINE

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Purification Engineering, Inc., Columbia, Md.

Continuation-in-part of Ser. No. 465,551, Feb. 10, 1983, and a continuation-in-part of Ser. No. 358,784, Mar. 16, 1982, Pat. No. 4,436,813. This application Jul. 29, 1983, Ser. No. 518,756

The portion of the term of this patent subsequent to Apr. 13, 2001, has been disclaimed.

Int. Cl.[4] C12P *13/22;* **C12N** *11/08, 11/04*

U.S. Cl. 435—108 **17 Claims**

13. A composition suitable for use in converting phenylpyruvic acid or phenylpyruvate to phenylalanine comprising immobilized cells having transaminase activity, said cells being immobilized with a polyazetidine polymer.

16. A process for preparing phenylalanine which comprises contacting cinnamic acid with immobilized cells having phenylalanine ammonia lyase actibity, said cells being immobilized with a polyazetidine polymer.

4,600,693

THERMOSTABLE ALPHA AMYLASE HAVING A LOW REQUIREMENT FOR CALCIUM IONS, DERIVED FROM A BACILLUS MICROORGANISM

Karen L. Kindle, Brooktondale, N.Y.; Stanley E. Mainzer, Burlingame, Calif.; Deborah L. Marlatt, Painted Post, and Constance B. Sawyer, Lindley, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,773

Int. Cl.[4] C12N *11/14, 11/02, 9/28, 1/20;* **C12R** *1/07*

U.S. Cl. 435—176 **4 Claims**

1. A biologicaly pure culture of a variant of *Bacillus stearothermophilus,* having the identifying characteristics of ATCC No. 39,536, which produces a thermostable amylase having a low calcium ion requirement and active at neutral pHs, when cultivated in a suitable nutrient medium.

4,600,694

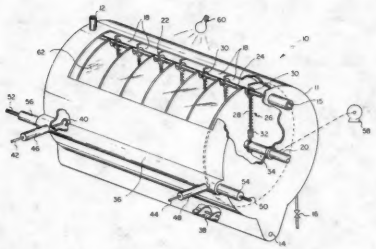
APPARATUS FOR HARVESTING CELLS

Robert A. Clyde, Station A - Box 6397, New Orleans, La. 70174

Filed May 24, 1985, Ser. No. 737,652

Int. Cl.[4] C12M *1/10*

U.S. Cl. 435—312 **7 Claims**



1. In a rotary biological contactor of the type adapted to treat fluids with converting microorganisms and having a rotatable shaft upon which are mounted a plurality of spaced supports on which the converting microorganisms can be immobilized and brought into contact with the fluid to be treated, a mechanism for physically detaching the converting microorganism from the supports and a mechanism for removing detached microorganisms from the contactor, the improvement wherein said detaching mechanism comprises a plurality of spaced scrapers located in between the supports, means for rotating the scrapers in synchronism with the supports, means for selectively stopping the rotation of the scrapers while permitting the continued rotation of the supports, and control means for controlling the pressure which the scrapers exert against the supports.

4,600,695

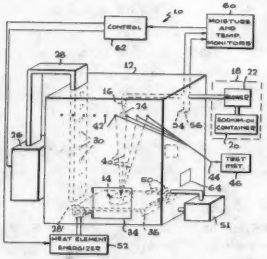
SODIUM FIRE SIMULATION PROCESS

Ralph L. Cummings, Anaheim Hills, and Marshall L. Clark, Orange, both of Calif., assignors to Wyle Laboratories, Norco, Calif.

Filed May 19, 1983, Ser. No. 495,983

Int. Cl.[4] G01N *17/00*

U.S. Cl. 436—2 **5 Claims**



1. A method for testing equipment to determine whether it can function when exposed to the gaseous products of combustion of a fire of an alkalai metal, which is chosen from the group which consists of sodium and potassium, in air that contains moisture comprising:

applying a powder of an oxide of said alkalai metal, with most powder particles of a size between about 3 and 100 microns, to said equipment;

establishing an ambient atmosphere surrounding said equip-

ment so the atmosphere includes moisture, to turn the metal alkalai oxide into a hydroxide; and

testing said equipment to determine whether it continues to function after at least some of the alkalai oxide has turned into a hydroxide.

4,600,696

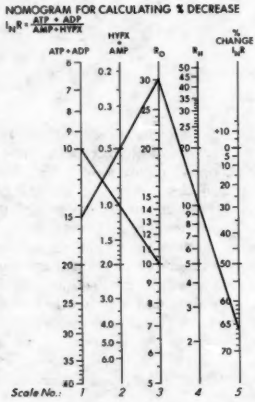
PROCESS AND KIT FOR DETERMINING BLOOD PLATELET STRESS

Clive C. Solomons, 164 S. Fairfax, Denver, Colo. 80222

Filed Jun. 22, 1984, Ser. No. 623,579

Int. Cl.[4] G01N *33/48*

U.S. Cl. 436—63 **14 Claims**



1. The process for determining the physical or chemical stress on blood platelets which comprises:

a. isolating a primary sample of blood platelets in plasma under conditions that minimize stress on the platelets,

b. dividing said primary sample into a control sample and at least two test samples in separate containers having surfaces that minimize stress to blood platelets,

c. challenging at least one of said test samples to a test composition,

d. challenging at least one other of said test samples to a positive control composition effective to stress blood platelets in a known manner,

e. dissolving the nucleotides, adenosine triphosphate (ATP), adenosine diphosphate (ADP), adenosine monophosphate (AMP) and hypoxanthine (HYPX) in said samples in a solvent for said nucleotides that does not stress the platelets,

f. separating the solutions formed with said samples from said platelets under conditions to minimize stress on said platelets,

g. passing known quantities of ATP, ADP, AMP, HYPX and an internal standard composition through a chromatographic column to determine whether the column is functioning properly,

h. measuring the concentration of adenosine triphosphate, adenosine diphosphate, adenosine monophosphate and hypoxanthine in each control sample and test sample to determine the ratio:

$$R = \frac{ATP + ADP}{AMP + HYPX}$$

i. and comparing the measured R value of the test sample with the measured R value for the control sample.

4,600,697

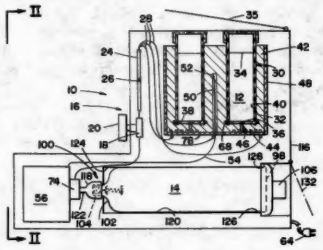
APPARATUS AND PROCESS FOR EQUILIBRATING GAS AND LIQUID

Ronald B. Smernoff, Belmont, Calif., assignor to Analytical Products, Inc., Belmont, Calif.

Filed Jun. 17, 1976, Ser. No. 697,269

Int. Cl.[4] G01N *33/50, 1/00*; B01L *11/00*

U.S. Cl. 436—174 **23 Claims**



22. A process for simultaneously equilibrating a plurality of aqueous solutions each with one of a plurality of gas compositions, comprising:

positioning a plurality of solution tubes each having an open end and a closed end in sealing mating fit within a respective one of a plurality of cavities formed within a heat conductive block with the open end thereof upwardly and a respective one of a plurality of aqueous solutions in each of said tubes;

adjusting the temperature of said solutions to be substantially equal by controlling the temperature of said block to a desired value; and

delivering a respective one of said plurality of gas compositions below a respective liquid level of a respective aqueous solution within each respective one of said tubes in the form of bubbles.

4,600,698

IMMUNOLOGICAL LATEX AGGLUTINATION IN PRESENCE OF CERTAIN LACTONES OR LACTAMS

Tibor Toth, Marburg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

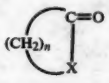
Filed Jan. 30, 1984, Ser. No. 575,403

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303083

Int. Cl.[4] G01N *33/546, 33/76*

U.S. Cl. 436—534 **8 Claims**

1. A latex agglutination procedure for detecting or determining a participant in an antigen-antibody reaction using the corresponding participant, which procedure comprises allowing the participants to react together in the presence of a compound of the formula I



(I)

in which

X is O or NH, and

n is an integer from 2–9.

4,600,699

RECLAMATION OF A PALLADIUM-TIN BASED ELECTROLESS PLATING CATALYST FROM THE EXHAUSTED CATALYST SOLUTION AND ACCOMPANYING RINSE WATERS

Constantine I. Courduvelis, Orange, Conn., assignor to Enthone, Incorporated, West Haven, Conn.

Filed Feb. 14, 1983, Ser. No. 465,909

Int. Cl.[4] B01J *38/68, 23/96;* **C23C** *16/06*

U.S. Cl. 502—24 **11 Claims**

1. A method for the reclamation for reuse of an electroless plating precious metal-tin catalyst from a weakened aqueous electroless plating activator solution and/or the spent rinse water solution comprising:

precipitating a precious metal-tin catalyst residue out of the solution by adding an effective amount of a base selected from the group of alkali hydroxides and alkali salts of weak-inorganic and organic acids to the weakened precious metal-tin catalyst activator solution and/or the spent rinse water solution; and

filtering and collecting the precipitated residue from the solution.

2. A method as in claim 1 wherein the precipitated residue is further treated by:

(d) dissolving the residue in an effective amount of a hydrohalide acid; and

(e) adjusting the resulting solution to a desired concentration.

3. A method as in claim 2 wherein the solution from step (e) is recycled back to the catalyst solution.

4,600,700

REGENERATION OF PLATINUM-CONTAINING ZEOLITE CATALYSTS WHICH INCLUDES OXIDATION OF COKE IN THE PRESENCE OF WATER

William D. McHale, Swedesboro, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,410

Int. Cl.[4] B01J *29/38, 23/96, 38/18, 38/22*

U.S. Cl. 502—50 **5 Claims**

1. A process for regenerating a coke-deactivated catalytic dewaxing platinum-Zeolite Beta catalyst, which consists essentially of the following steps in sequence:

(1) contacting said Zeolite Beta catalyst with from 1 to 21 volume % oxygen in the presence of from 1.5 to 3.0 volume % water at a temperature of from 290° to 385° C., and a pressure of about 0–400 psig in an offsite thin-layer moving bed regenerator under conditions such that said Zeolite Beta catalyst is oxidized without causing significant agglomeration of said platinum on said Zeolite Beta catalyst; and

(2) exposing the resulting Zeolite Beta catalyst to hydrogen at a temperature of from 350° to 450° C. and a pressure of from 150 to 250 psig at a contact time ranging from about 2 to 5 hours.

3. The process of claim 1, wherein said Zeolite Beta has a silica-to-alumina mole ratio no less than 20.

5. The process of claim 1, wherein said Zeolite Beta further comprises inorganic binders selected from alumina, silica, silica-alumina, magnesium, titania, zirconia, or thoria.

4,600,701

NICKEL-BORIDE POLYMER CATALYST

Rudolph O. de Jongh, The Hague, and Cornelis van Dijk, Zwijndrecht, both of Netherlands, assignors to Internationale Octrol Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Apr. 12, 1985, Ser. No. 722,383

Claims priority, application Netherlands, Apr. 19, 1984, 8401301

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **13 Claims**

1. Process for preparing a finely dispersed nickel-boride catalyst stabilised with a linear organic polymer, characterised in that an at least partly dissolved nickel salt containing less than 6 molecules of crystal water in the presence of an at least partly dissolved linear organic polymer is reduced with the aid of an alkali borohydride.

4,600,702

VAPOR PHASE NITRATION CATALYSTS

Ignatius Schumacher, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 14, 1984, Ser. No. 671,279

Int. Cl.[4] B01J *27/24, 31/00, 21/18, 23/00*

U.S. Cl. 502—200 **4 Claims**

1. A nitration promoting catalyst composition represented by the empirical formula:

$$(M^1_aM^2_bO_c)_x(NO_2)_y$$

wherein M^1 is at least one element selected from Group 4b of the Periodic Table of the Elements, M^2 is at least one element selected from Group 3b of the Periodic Table of the Elements, a is 1, b is 0.050 to 20, c is a number taken to satisfy the average valences of M^1 and M^2 in the oxidation states in which they exist in the composition, x is 1, and y is 0.15 to 0.30.

4,600,703

CATALYST FOR THE HYDROCRACKING OF HEAVY VACUUM GAS OILS, METHOD OF PREPARATION OF CATALYST AND PROCESS FOR USE THEREOF IN THE MILD HYDROCRACKING OF HEAVY VACUUM GAS OILS

Alfredo L. Morales, San Antonio de Los Altos; Jose A. S. Guillén, Los Teques; Magdalena M. de Agudelo, Estado Miranda; Nelson P. Martinez, San Antonio de Los Altos, and Angel R. Carrasquel, Los Teques, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 724,969, Apr. 19, 1985, which is a continuation-in-part of Ser. No. 563,197, Dec. 19, 1983, Pat. No. 4,520,128. This application Jul. 8, 1985, Ser. No. 752,661

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.[4] B01J *27/188*

U.S. Cl. 502—210 **7 Claims**

6. A catalyst for use in the mild hydrocracking of heavy vacuum gas oils containing high levels of sulfur, nitrogen, aromatics, saturates and olefins, comprising an alumina carrier, a component selected from the metallic elements of Group VIB of the Periodic Table, a component selected from the metallic elements of Group VIII of the Periodic Table and a phosphorus oxide component wherein said phosphorus oxide is added in an amount with respect to the metallic elements of Group VIB of the Periodic Table and Group VIII of the Periodic Table such that the ratio P/(Group VIB metal+-Group VIII metal) is between 0.7 to 1.1, said catalyst having a surface area of between 130 to 300 m^2/g and total pore volume of between 0.4 to 0.8 cc/g wherein between 60 to 100% of the total pore volume comprises pores having a diameter of between 20 to 500 Å.

4,600,704

CATALYST

James R. Jennings, Yarm, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 19, 1984, Ser. No. 652,052

Claims priority, application England, Oct. 19, 1983, 8327933

Int. Cl.[4] B01J *23/06, 23/72, 23/74*

U.S. Cl. 502—318 **7 Claims**

1. A process for producing a substantially iron-free solution containing copper nitrate from a solid catalyst composition comprising copper in the form of metal and/or oxide and an oxide of at least one other metal selected from the group con-

sisting of iron, zinc, aluminum, titanium, vanadium, chromium and manganese, said process comprising:

reacting the composition with nitric acid in an amount sufficient to dissolve at least 90% of the copper in the composition, controlling the acid concentration at less than 5 molar during the reaction; and/or controlling the nitric acid concentration at the end of the reaction a pH sufficiently low to dissolve at least 90% of the copper initially present; wherein any iron oxide present in the composition remains substantially undissolved and then

removing undissolved material by filtration to give a copper nitrate containing solution as the filtrate.

4,600,705

GONADOLIBERIN DERIVATIVES CONTAINING A β-ASPARTYL GROUP, A PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Janos Seprödi; István Teplán; Imre Mezö, and Judit Érchegyi, all of Budapest, Hungary, assignors to Richter Gedeon Veyteszeti Gyar R.T., Hungary

Filed Mar. 29, 1984, Ser. No. 594,880

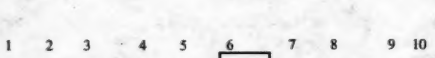
Claims priority, application Hungary, Mar. 29, 1983, 1062/83

Int. Cl.[4] A61K *37/02*; C07C *103/52*

U.S. Cl. 514—15 **3 Claims**

1. Gonadoliberine derivatives of the formula (I)

(I)



wherein

X represents an —O—R group, wherein R is a benzyl group or a C_{1-4} alkyl group, and

group, wherein R1 and R2 independently stand for hydrogen, a C_{1-5} alkyl, aryl, or aryl-C_{1-2}-alkyl group, or they stand together with the adjacent nitrogen atom for a morpholino, 1-indolinyl or 1-pyrrolidinyl group,

Y is a glycine amide or a C_{1-4}-alkylamide group,

and therapeutically acceptable salts thereof.

4,600,706

ANTI-FUNGAL FEED COMPOSITIONS CONTAINING NATAMYCIN

A. F. Carter, 705 E. Highpoint, Springfield, Mo. 65807

Filed Nov. 17, 1983, Ser. No. 552,771

The portion of the term of this patent subsequent to Aug. 20, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/71*; C07H *17/08*

U.S. Cl. 514—31 **6 Claims**

1. A method for improving animal feed which contains moisture to prevent or inhibit the onset of and reduce fungal or mold growth in the feed prior to consumption by an animal to thereby prevent or inhibit mycotoxicoses in the animal, which comprises blending about 0.000055 to 0.011 weight percent of natamycin into the animal feed.

4,600,707

BENZOTHIEN-3-YL ADENOSINE; BENZOTHIEN-3-YL ADENOSINE, S-OXIDE; AND BENZOTHIEN-3-YL, S,S-DIOXIDE ADENOSINE COMPOUNDS

William Patt, Chelsea, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

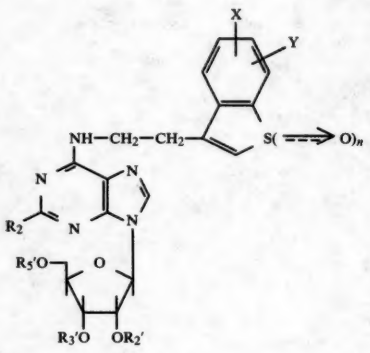
Filed Jan. 25, 1985, Ser. No. 695,022

Int. Cl.[4] A61K *31/70*; C07H *19/06*

U.S. Cl. 514—46 **14 Claims**

1. A compound of the formula

I



wherein=== is — or ═, n is 0–2, inclusive, X and Y are each independently H, hydroxy, lower alkoxy, lower alkyl, amino, mono-lower alkylamino, di-lower alkylamino, nitro, or halogen; R_2 is H, halogen, or amino; R_2', R_3', and R_5' are independently H, lower alkanoyl, benzoyl, or benzoyl substituted by lower alkyl, lower alkoxy, halogen, or when taken together, R_2' and R_3' may be 2',3'-lower alkylidene; or pharmaceutically acceptable acid addition salts thereof.

13. A pharmaceutical composition treading psychosis comprising an anti psychotic effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

14. A method for treating psychosis in a mammal suffering therefrom comprising administering to such mammal an anti-psychotic effective amount of a compound as claimed in claim 1 in unit dosage form.

4,600,708

PROPRANOLOL HYDROCHLORIDE LIQUID FORMULATIONS

Gerald L. Reuter, Plattsburgh, and Mark E. Coons, Champlain, both of N.Y., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 19, 1985, Ser. No. 757,213

Int. Cl.[4] A61K *31/13, 31/135, 31/685*

U.S. Cl. 514—78 **4 Claims**

1. A liquid oral therapeutic dosage form composition of propranolol hydrochloride having satisfactory taste and anesthesia masking characteristics containing for each 10 milligrams per milliliter of propranolol hydrochloride in such composition about 8 to about 14 precent weight by volume of oil free lecithin and about 0.5 to 10% by weight of at least one basic amino acid.

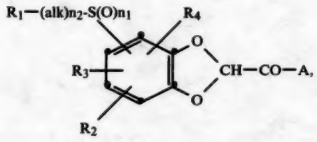
4,600,709

BENZODIOXOLE DERIVATIVES, PROCESSES FOR THE MANUFACTURE THEREOF AND CORRESPONDING PHARMACEUTICAL COMPOSITIONS

Marc E. Ballenegger, Gimel, and Paul Zbinden, Witterswil, both of Switzerland, assignors to Ciba-Geigy AG, Basle, Switzerland

Continuation-in-part of Ser. No. 543,556, Oct. 19, 1983, abandoned. This application Dec. 7, 1984, Ser. No. 679,661
Claims priority, application Switzerland, Oct. 22, 1982, 6163/82; Apr. 6, 1984, 1752/84
Int. Cl.[4] A61K *31/36*; C07D *317/44*
U.S. Cl. 514—228 21 Claims

1. A compound of formula I

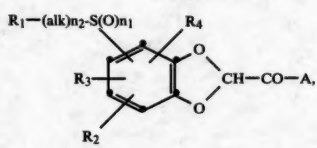


(I)

in which R_1 represents phenyl, thienyl, furyl or ar-benzothiazolyl, each of which is unsubstituted or substituted a maximum of three times by lower alkyl, lower alkoxy, halogen having an atomic number of up to 35, lower alkanoyl and or by lower alkanoylamino, alk represents alkylene, alkylidene or alkenylene having a maximum of 3 carbon atoms, R_2 represents lower alkyl or halogen having an atomic number of up to 35, R_3 represents hydrogen, lower alkyl or halogen having an atomic number of up to 35, R_4 represents hydrogen and n_1 is 1 or 2, n_2 is 0 or 1, and A represents the radical —O—R_5, wherein R_5 represents hydrogen or an aliphatic or araliphatic hydrocarbon radical having, in total, a maximum of 12 carbon atoms, that is unsubstituted or substituted, in a position higher than the 1- or alpha-position, by a halogen having an atomic number of up to 35, hydroxy or by lower alkoxy, or R_5 represents a radical

in which R_6 and R_7 each represents, independently of the other, hydrogen or lower alkyl, or R_6 and R_7 are bonded to one another and is, together with the adjacent nitrogen atom, an optionally lower alkyl substituted tetra to hexamethylene imino, 4 morpholinyl or 1H-tetrazol-1-yl; and the salts with bases of those compounds in which R_5 represents hydrogen.

2. Compounds of the general formula I



(I)

in which R_1 represents phenyl or thienyl, each of which is unsubstituted or substituted a maximum of three times by lower alkyl, lower alkoxy, halogen having an atomic number of up to 35, lower alkanoyl and/or by lower alkanoylamino, alk represents methylene, n_1 represents 2, n_2 represents 0 or 1, R_2 represents lower alkyl or halogen, R_3 represents hydrogen or lower alkyl, R_4 represents hydrogen and A represents OR_5 wherein R_5 represents hydrogen or lower alkyl, and the pharmaceutically acceptable salts of those compounds in which R_5 represents hydrogen with bases.

20. A pharmaceutical preparation for the treatment of oedema and hypertension comprising an amount, which is an anti-oedema and antihypertensive effective amount, of a compound according to claim 1, or of a pharmaceutically acceptable salt thereof with a base, and at least one pharmaceutically acceptable carrier.

21. A method for treatment of oedema and hypertension in a mammal in need of such treatment comprising oral or parenteral administration of an amount, which is an anti-oedema and antihypertensive effective amount, of a compound according to claim 1, or of a pharmaceutically acceptable salt thereof with a base.

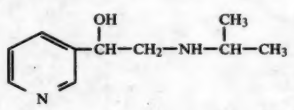
4,600,710

β-ADRENERGIC RECEPTOR AGONIST ALKYLAMINOALKYL PYRIDINEMETHANOL DERIVATIVES

Chi-Dean Liang, Glenview, and Gerald M. Walsh, Lindenhurst, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Mar. 14, 1985, Ser. No. 711,899
Int. Cl.[4] C07D *213/38*; A61K *31/44*
U.S. Cl. 514—357 11 Claims

1. A compound of the formula



which is α[(1-methylethylamino)methyl]-3-pyridinemethanol and pharmaceutically acceptable salts thereof.

3. A pharmaceutical composition comprising a β-adrengergic receptor agonist effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier.

4,600,711

COMPOSITION FOR TOPICAL AND INFUSION TREATMENT OF WOUNDS AND BURNS

Thomas W. Swerczek, Lexington, Ky., assignor to The University of Kentucky Research Foundation, Lexington, Ky.

Continuation-in-part of Ser. No. 409,180, Aug. 18, 1982, Pat. No. 4,483,851. This application Oct. 15, 1984, Ser. No. 660,862
The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—23 21 Claims

1. A composition for the treatment of bacterial infections which comprises dextrose in an aqueous based mixture including a buffer present in sufficient amounts to provide a pH in the range of from 3.0 to 6.5, and a carrier; said composition comprising the following: 50 to 500 parts by weight of dextrose, 5 to 200 parts by weight of buffer comprising a mixture of hydroxy carboxylic acids and alkali metal salts of hydroxy carboxylic acids, 50 to 150 parts by weight of a carrier to increase viscosity of the composition, and about 5 to 100 parts by weight of an alkali metal salt of acetic acid.

4,600,712
FUNGICIDALLY ACTIVE COMPOSITIONS CONTAINING ETHENE DERIVATIVES

Pieter T. Haken, Eastling, Nr. Faversham, and Shirley B. Webb, Faversham, both of England, assignors to Shell Oil Company, Houston, Tex.

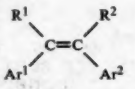
Continuation-in-part of Ser. No. 535,496, Sep. 26, 1983, abandoned. This application Oct. 9, 1985, Ser. No. 785,693

Claims priority, application United Kingdom, Sep. 27, 1982, 8227480

Int. Cl.[4] A01N *43/54, 43/58, 43/60, 55/02*

U.S. Cl. 514—188 **2 Claims**

1. A method of controlling fungi selected from *Plasmopara viticola, Botrytis cinerea, Phytophthera infestans, Erysiphe graminis, Podsophaera leucotrica* or *Cercospora arachidicola,* at a locus which comprises applying to the locus a fungicidally effective amount of a compound of the formula:



wherein one of Ar^1 and Ar^2 is selected from the group consisting of pyridyl, pyrazinyl, pyridazinyl and pyrimidinyl, and the other is phenyl substituted by one or two halogen atoms, R^1 is hydrogen or alkyl of from one to six carbon atoms, R^2 is cyano or —C(O)—X—R wherein X is oxygen (—O—) or sulfur (—S—), with the provisos that when X is oxygen, R is hydrogen or alkyl of from one to six carbon atoms, and when X is sulfur, R is alkyl of one to six carbon atoms, or a salt thereof with an acid selected from the group consisting of sulfonic acids, carboxylic acids, hydrohalic acids and sulfuric acid, and when R is hydrogen, a complex thereof with a salt selected from the group consisting of salts of alkali metals, alkaline earth metals, iron, copper, zinc, manganese, ammonium salts and alkyl-substituted ammonium salts.

4,600,713
1-, 6- AND 2-SUBSTITUTED-1-CARBA-2-PENEM-3-CARBOXYLIC ACIDS

Burton G. Christensen, Scotch Plains, and David H. Shih, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

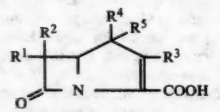
Continuation of Ser. No. 363,340, Mar. 29, 1982, abandoned, which is a continuation of Ser. No. 99,451, Dec. 3, 1979, abandoned. This application Dec. 5, 1983, Ser. No. 557,779

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.[4] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 **8 Claims**

1. A compound having the structure:



and the pharmaceutically acceptable salts and esters thereof; wherein R^1, R^2, R^3, R^4 and R^5 are independently selected from the group consisting of hydrogen, and substituted and unsubstituted: alkyl having 1–6 carbon atoms, aralkyl, alkenyl and alkynyl having 2–6 carbon atoms, aryl and aralkyl having 6–10 ring carbon atoms and 1–6 carbon atoms in the alkyl chain, heterocyclyl, heterocyclylthio (R^3 is excluded) and heterocyclylalkyl having 1–5 hetero atoms selected from O, N or S in the ring and 1–6 carbon atoms in the alkyl chain, cycloalkyl, spirocycloalkyl, and cycloalkylalkyl having 3 to 6 ring carbon atoms and 1–6 carbon atoms in the alkyl moiety; wherein the substituents on R^1, R^2, R^3, R^4 and R^5 are selected from chloro, bromo, fluoro, iodo, hydroxyl, amino, mono-, di- and tri-alkyl substituted amino (each alkyl having 1–6 carbon atoms) alkoxyl having 1–6 carbon atoms, guanidino, cyano, amidino and carboxyl; with the proviso that R^4, R^5 and R^3 are not hydrogen.

4,600,714
FENOLDOPAM 4',8-BIS-HYDROGEN SULFATE AND DOPAMINERGIC USE THEREOF

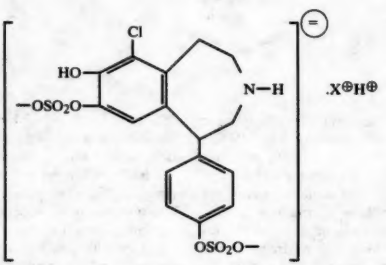
Dimitri Gaitanopoulos, Eagleville, and Joseph Weinstock, Phoenixville, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 26, 1984, Ser. No. 604,101

Int. Cl.[4] A61K *31/59;* **C07D** *223/14*

U.S. Cl. 514—213 **7 Claims**

1. A compound of the formula:



in which $X^{\oplus}$ is $H^{\oplus}$ or a pharmaceutically acceptable cation.

7. The method of inducing dopaminergic activity in a patient in need thereof comprising administering orally or parenterally to said patient an effective therefor, nontoxic quantity of a compound of claim 1.

4,600,715
BENZODIAZEPINE ANTAGONISTIC β-CARBOLINE DERIVATIVES AND COMPOSITIONS THEREOF

Andreas Huth; Ralph Schmiechen; Dieter Seidelmann; Dieter Rahtz, all of Berlin, Fed. Rep. of Germany; Mogens Engelstoft, Vaerlose, and Claus T. Braestrup, Roskilde, both of Denmark, assignors to Shering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

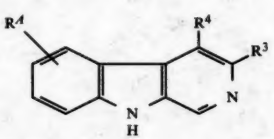
Filed Jun. 22, 1984, Ser. No. 623,671

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322894

Int. Cl.[4] A61K *31/68, 31/535;* **C07D** *471/06, 403/06*

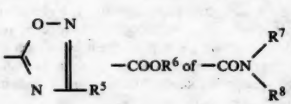
U.S. Cl. 514—222 **44 Claims**

1. A β-carboline of the formula



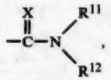
wherein

R^3 is an oxadiazolyl group of the formula



wherein R^5 is lower alkyl of up to 5 carbon atoms, R^6 is lower alkyl, aralkyl, or alkoxyalkyl of up to 7 carbon atoms, and R^7 and R^8 which are alike or different, each are hydrogen or lower alkyl of up to 5 carbon atoms or collectively form with the amido nitrogen atom a piperidino ring;

R^4 is hydrogen, lower alkyl of up to 3 carbon atoms or CH_2OR^9 wherein R^9 is lower alkyl of up to 3 carbon atoms; and R^4 is in the 5- or 6-position and is —$COOR^{10}$ or



wherein R^{10} is alkoxyalkyl or alkenyl of up to 5 carbon atoms, or benzyl, wherein X is oxygen or sulfur and R^{11} and R^{12}, which are alike or different, are hydrogen, lower alkyl or lower alkenyl or, collectively with the amido nitrogen atom, form morpholino, thiomorpholino, pyrrolidino, piperazino, 4-phenyl-piperazino, 4-methyl-piperazino or piperidino.

43. 5-piperidinocarbonyl-β-carboline-3-carboxylic acid ethyl ester, a compound of claim 1.

4,600,716
1,2-DIHYDROPYRIDO[3,4-B]PYRAZINES

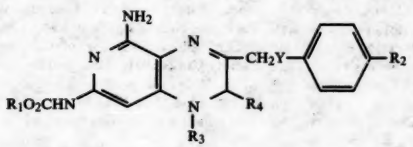
Carroll G. Temple; John A. Montgomery; Robert D. Elliott, and Glynn P. Wheeler, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Continuation-in-part of Ser. No. 362,480, Mar. 26, 1982, abandoned. This application Mar. 28, 1985, Ser. No. 716,945

Int. Cl.[4] A61K *31/495;* **C07D** *471/04, 213/61*

U.S. Cl. 514—249 **8 Claims**

1. A 1,2-dihydropyrido[3,4-b]pyrazine having the formula:



wherein Y is CH_2 or $N(CH_3)$; R_1 is a lower alkyl group; R_2 is a member selected from the group consisting of hydrogen, CH_3O or Cl; R_3 and R_4 are either both hydrogen or one is hydrogen and the other is a lower alkyl group; and pharmaceutically acceptable salts thereof.

8. A pharmaceutical composition in dosage unit form comprising an effective amount to ammeliorate cancer diseases in mammals of a compound as defined by claim 1 in association with a pharmaceutical carrier.

4,600,717
ALDOSE REDUCTASE INHIBITORS USEFUL IN OPHTHALMIC WOUND HEALING

Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Apr. 11, 1984, Ser. No. 599,283

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.[4] A61K *31/44, 31/415*

U.S. Cl. 514—278 **3 Claims**

1. A method of promoting wound healing in a wounded host organ in a diabetic host comprising topically applying to the wounded host organ a therapeutically effective, wound healing amount of a wound healing aldose reductase inhibitor, selected from the group consisting of:

a. Spiro-(7-fluoro-4H-indeno[1,2-b]thiophen-4,4'-imidazolidine)-2',5'-dione;
b. Spiro-(2-fluoro-9H-fluoren-9,4'-imidazolidine)-2',5'-dione;
c. Spiro-(2-fluoro-9H-fluoren-9,3'-succinimide);
d. Spiro-(7-fluoro-5H-indeno[1,2-b]-pyridin-5,4'-imidazolidine)-2',5'-dione;
e. Spiro-(7-chloro-5H-indeno[1,2-b]-pyridin-5,4'-imidazolidine)-2',5'-dione;
f. Spiro-(7-chloro-9H-pyrrolo[1,2-a]indol-9,4'-imidazolidine)-2',5'-dione;
g. Spiro-(2,7-difluoro-9H-fluoren-9,4'-imidazolidine)-2',5'-dione;
h. Spiro-(2,7-difluoro-9H-fluoren-9,3'-succinimide) and
i. Spiro-(2,7-difluoro-9H-fluoren-9,5'-oxazolidine)-2',4'-dione.

4,600,718
METHOD OF TREATING WEIGHT LOSS DISORDERS

Hans F. Huebner, 106 Beach Ave., Larchmont, N.Y. 10538

Continuation of Ser. No. 651,594, Sep. 18, 1984, Pat. No. 4,546,103. This application Jun. 6, 1985, Ser. No. 742,223

The portion of the term of this patent subsequent to Oct. 8, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **2 Claims**

1. A method of treating weight loss disorders consisting essentially of administering to a mammal having a weight loss disorder a daily dosage of an effective amount which consists essentially of at least about 10 milligrams per 37 kilogram body weight of at least one opiate antagonist.

4,600,719
TETRAHYDROPYRIDINE AND PIPERIDINE DERIVATIVES

Karl Schenker, Binningen, and Raymond Bernasconi, Oberwil, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

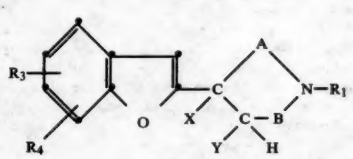
Continuation of Ser. No. 426,490, Sep. 29, 1982, abandoned, which is a continuation of Ser. No. 107,981, Dec. 28, 1979, abandoned, which is a division of Ser. No. 893,104, Apr. 5, 1978, Pat. No. 4,210,655, which is a continuation of Ser. No. 657,652, Feb. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 446,244, Feb. 27, 1974, abandoned. This application Sep. 13, 1984, Ser. No. 650,331

Claims priority, application Switzerland, Mar. 2, 1973, 3103/73

Int. Cl.[4] A61K *31/445;* **C07D** *405/04*

U.S. Cl. 514—320 **18 Claims**

1. A compound of the formula



(I)

wherein R_1 represents methyl, allyl, 3-oxobutyl, 3-hydroxybutyl or phenyl-loweralkyl in the benzene ring being unsubstituted or substituted by lower alkoxy, R_3 represents hydrogen, lower alkoxy, halogen up to atomic number 35, trifluoromethyl, 1-hydroxycycloalkyl, cycloalk-1-enyl or cycloalkyl, each of the three last named groups having 5–8 carbon atoms, R_4 represents hydrogen, lower alkoxy or halogen up to atomic number 35, or R_3 and R_4 together represent trimethylene, tetramethylene, or corresponding to a fused-on benzene ring the 1,3-butadienylene radical, A and B represent methylene, ethylene, trimethylene or the direct bond, whereby A and B together always contain 3 chain members, and X and Y each represent hydrogen or together they represent an additional bond, with the proviso, that, if R_1 represents methyl, R_3 and

R_4 each represent hydrogen, and X and Y each represent hydrogen or together they represent an additional bond, then A represents methylene or trimethylene, B represents ethylene or trimethylene, or each A and B represent the direct bond, whereby A and B together always contain 3 chain members, or a pharmaceutically acceptable acid addition salt thereof.

4,600,720

PHARMACOLOGICALLY ACTIVE COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Ltd., Welwyn Garden, England

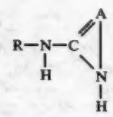
Division of Ser. No. 621,778, Jun. 18, 1984, Pat. No. 4,537,779, which is a division of Ser. No. 485,535, Apr. 15, 1983, Pat. No. 4,470,985, which is a division of Ser. No. 364,134, Mar. 31, 1982, Pat. No. 4,399,142, which is a division of Ser. No. 239,238, Mar. 3, 1981, Pat. No. 4,341,787, which is a division of Ser. No. 60,324, Jul. 25, 1979, Pat. No. 4,282,221, which is a division of Ser. No. 893,859, Apr. 6, 1978, Pat. No. 4,181,730, which is a division of Ser. No. 736,662, Oct. 29, 1976, Pat. No. 4,104,381, which is a division of Ser. No. 619,985, Oct. 6, 1975, Pat. No. 4,005,205, which is a division of Ser. No. 463,647, Apr. 24, 1974, Pat. No. 3,932,644. This application Jun. 5, 1985, Ser. No. 741,649

Claims priority, application United Kingdom, May 3, 1973, 21063/73; Jul. 26, 1973, 35551/73

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—340 **5 Claims**

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said receptors in an effective amount to inhibit said receptors a heterocyclic compound of the formula:



wherein A taken together with the nitrogen and carbon atoms shown forms a thiazoline, quinazoline or quinoline ring, said ring having a keto, thione or sulfone group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups; R is a grouping of the formula:

$$Het—CH_2Z(CH_2)_n—$$

wherein Het is a pyridine ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or when the A-containing ring is other than thiazoline, Z may be a methylene group and n is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,600,721

PHARMACEUTICAL PREPARATION

Peter Mörsdorf, Cadolzburg; Helmut Schickaneder, Eckental; Heidrun Engler, Cadolzburg; Istvan Szelenyi, Schwaig; Kurt H. Ahrens, Nuremberg, and Kay Brune, Marloffstein, all of Fed. Rep. of Germany, assignors to Ludwig Heumann & Co., GmbH, Fed. Rep. of Germany

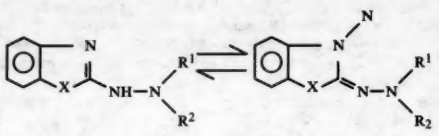
Filed Mar. 27, 1985, Ser. No. 716,408

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1984, 3413876

Int. Cl.[4] A61K *31/42, 31/425*

U.S. Cl. 514—367 **24 Claims**

1. A method of treating a phlogistic condition which comprises administering to a host in need thereof an antiphlogistic effective amount of a benzazole derivative of the formula



wherein X represents a sulphur or oxygen atom and R^1 represents a hydrogen atom and R^2 a hydroxymethyl, formyl, lower carbalkoxy or lower acyl group or R^1 and R^2 together represent the group

wherein R^3 and R^4 denote, independently of one another, a hydrogen atom or a C_1–C_6-alkyl group, or a physiologically acceptable salt thereof.

4,600,722

3-AMINO-1-(4,5,6,7-TETRAHYDRO-BENZO-THIAZOLYL)-2-PYRAZOLINES AND A PROCESS FOR THE TREATMENT OF INFLAMMATORY OR ALLERGIC PROCESSES IN HUMANS

Joachim Uhlendorf, Erftstadt; Harald O. Borbe, Cologne; Sigurd Leyck; Michael J. Parnham, both of Pulheim, and Helmut Wetzig, Pulheim-Sinnersdorf, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

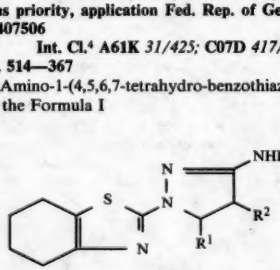
Filed Feb. 26, 1985, Ser. No. 705,670

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407506

Int. Cl.[4] A61K *31/425;* **C07D** *417/04*

U.S. Cl. 514—367 **5 Claims**

1. 3-Amino-1-(4,5,6,7-tetrahydro-benzothiazolyl)-2-pyrazolines of the Formula I



I

wherein R^1 is a member selected from the group consisting of hydrogen, methyl and phenyl, R^2 is a member selected from the group consisting of hydrogen and methyl and R^3 is a member selected from the group consisting of hydrogen, C_{1-4}-alkyl, 2,2,2-trifluoroethyl and —CO—R^4, where R^4 is a member selected from the group consisting of hydrogen, methyl, trifluoromethyl, ethyl and propyl; and the pharmaceutically acceptable acid addition salts thereof.

5. Process for the prophylactic and therapeutic treatment of inflammatory or allergic processes in humans comprising administering to a human being suffering from an inflammatory or allergic process a compound according to any one of claims 1 to 4 in a dose ranging from 10 to 1,000 mg per day.

4,600,723

METHOD FOR MINIMIZING DISTURBANCES IN CIRCADIAN RHYTHMS OF BODILY PERFORMANCE AND FUNCTION

Roger V. Short, Glen Waverley, and Stuart Armstrong, Abbotsford, both of Australia, assignors to Monash University, Clayton, Australia

Filed May 18, 1984, Ser. No. 611,677

Claims priority, application Australia, May 18, 1983, PF9418; Apr. 27, 1984, PG4737

Int. Cl.[4] A61K *31/40*

U.S. Cl. 514—416 13 Claims

1. A method of alleviating the effects of disturbed circadian rhythms on bodily performance and function in a human subject comprising administering orally to said subject melatonin at a time when the subject's sleep cycle should commence, the amount of melatonin being sufficient to re-entrain the disturbed circadian rhythms of said subject.

4,600,724

N-NAPHTHOYLGLYCINE DERIVATIVES

Kazimir Sestanj, St. Laurent; Nedumparambil A. Abraham, Dollard des Ormeaux; Francesco Bellini, Mount Royal, and Adi Treasurywala, Point Claire, all of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Division of Ser. No. 530,457, Sep. 9, 1983, Pat. No. 4,568,693, which is a division of Ser. No. 321,306, Nov. 13, 1981, Pat. No. 4,439,617. This application Jul. 17, 1985, Ser. No. 756,139

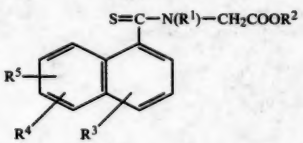
Claims priority, application Canada, Mar. 2, 1981, 372119

The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.

Int. Cl.[4] C07C *153/05;* A61K *31/195*

U.S. Cl. 514—510 20 Claims

1. A compound of formula I



(I)

wherein R^1 is hydrogen, lower alkyl, lower alkenyl or phenylmethyl; R^2 is hydrogen or lower alkyl; R^3 is a substituent at position 4, 5 or 8 of the naphthalene ring, the substituent being halo, and R^4 and R^5 each is hydrogen; or R^3 and R^4 each is a substituent at different positions selected from positions 3 to 7 of the naphthalene ring, the substituents being selected from the group consisting of lower alkyl, and, halo, (lower)alkoxy(lower)alkoxy, phenylmethoxy and phenylmethoxy substituted on the phenyl portion with a lower alkyl, lower alkoxy, halo or trihalomethyl, and R^5 is hydrogen; or a therapeutically acceptable salt with an organic or inorganic base of the compound of formula I wherein R^2 is hydrogen.

4,600,725

ESTERS OF A BENZOYL ALKANOIC ACID AND BENZYLIC ALCOHOL

Aldo Garzia, Rimembranze, Italy, assignor to Vittadini Gianluigi, New York, N.Y.

Filed May 8, 1984, Ser. No. 608,129

Int. Cl.[4] C07C *69/76*

U.S. Cl. 514—545 8 Claims

1. The method of promoting growth in animals, comprising administering at least a growth promoting effective amount of an ester of a benzoyl alkanoic acid and a benzylic alcohol.

4,600,726

PREPARATION OF ETHYLENE GLYCOL

Werner Bertleff, Viernheim; Franz-Josef Müller, Wachenheim; Rudolf Kummer, Frankenthal, and Wolfgang Harder, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 24, 1985, Ser. No. 758,293

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1984, 3427138

Int. Cl.[4] C07C *27/06*

U.S. Cl. 518—701 4 Claims

1. In a process for the preparation of ethylene glycol from the reaction of carbon monoxide and hydrogen in an inert organic liquid under superatmospheric pressure and at an elevated temperature in the presence of a rhodium-containing catalyst, the improvement which comprises carrying out said reaction with the rhodium catalyst in combination with a cobalt catalyst, the molar ratio of rhodium to cobalt being from about 20:1 to 60:1.

4,600,727

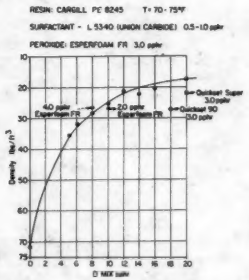
COMPOSITION AND METHOD FOR MAKING FOAMED POLYESTER RESIN

Ronald L. Pastorino, San Anselmo, Calif., assignor to U.S. Peroxygen Company, Richmond, Calif.

Filed Jun. 22, 1984, Ser. No. 623,811

Int. Cl.[4] C08J *9/08*

U.S. Cl. 521—82 11 Claims


RESIN: CARGILL PE 8245 T= 70 - 75°F
SURFACTANT - L 5340 (UNION CARBIDE) 0.5-1.0 pphr
PEROXIDE: ESPERFOAM FR 3.0 pphr
4.0 pphr Esperfoam FR
2.0 pphr Esperfoam FR
Quickset Super 3.0 pphr
Quickset 90 3.0 pphr
Density (lbs/ft)3
0 2 4 6 8 10 12 14 16 18 20
D MIX pphr

1. In the method for making a foamed polyester resin by curing and crosslinking unsaturated polyester resin and expanding the resin into a cellular structure with a gas, the improvement wherein said gas is generated by incorporating in the resin an effective amount of a resin foaming composition in the presence of an acid for gas liberating reaction with said composition, said composition comprising; a salt selected from sodium and potassium carbonates and bicarbonates; water; and intermixed therewith sufficient finely divided solid free flow agent to absorb said water and make the composition a free flowing powder.

4,600,728

ELASTOMER COMPOSITIONS CONTAINING HUMATES

Harold R. MacKeighen, Akron, and Vincent T. Cortesi, Cuyahoga Falls, both of Ohio, assignors to Alfred D. Lobo Co., L.P.A., Cleveland, Ohio

Division of Ser. No. 662,388, Oct. 18, 1984. This application Jul. 24, 1985, Ser. No. 758,356

Int. Cl.[4] C08J *9/08, 9/10*

U.S. Cl. 521—84.1 10 Claims

1. A foamable composition for forming a shaped article comprising a formable curable elastomer together with an effective amount of water-insoluble precipitated humic acid humate sufficient to provide the shaped article with desirable physical and chemical properties, wherein said humic acid

humate has a number average molecular weight of from about 2,000 to about 1,300,000 and has a carbon content of from about 20 percent to about 60 percent and is a finely divided solid having a primary particle size smaller than about 180 microns.

4,600,729

PROCESS FOR THE PREPARATION OF ALIPHATIC-AROMATIC POLY-AMIDE-IMIDES IN THE ABSENCE OF PHENOLS

Wilfried Zecher, Leverkusen, and Klaus Reinking, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

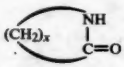
Filed Feb. 19, 1985, Ser. No. 703,094

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407201

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—128 **2 Claims**

1. Process for the preparation of aliphatic-aromatic polyamide-imides from organic polyisocyanates and polycarboxylic acid anhydrides characterized in that lactams of the formula



are used as the reaction medium and solvent wherein x denotes an integer from 2 to 20.

4,600,730

STABLE PREPOLYMERS OF POLYISOCYANATE WITH HYDROXYL FUNCTIONS, A PROCESS FOR THEIR MANUFACTURE AND THEIR APPLICATION TO THE MANUFACTURE OF POLYURETHANES

Francois-Bernard Laumain, Levallois-Perret, France, assignor to Societe Chimique des Charbonnages S.A., France

Filed Dec. 19, 1984, Ser. No. 683,630

Int. Cl.[4] C08G *18/14, 18/50*

U.S. Cl. 521—167 **12 Claims**

1. Stable polyisocyanate prepolymers containing hydroxy groups, consisting of products of polyaddition of at least one organic polyisocyanate to at least one product of condensation (A) of an alkylene oxide with an amine, in the presence of at least one polyol (B) containing free hydroxy functions, in which the said polyol (B) contains primary hydroxy functions and has a molecular weight greater than or equal to 3,000.

2. Prepolymers as claimed in claim 1, in which the prepolymers are defined by the following four relationships:

(a) $nN/a\alpha+b\beta$ of between 0.05 and 0.95;

(b) $n/n+a+b$ of between 0.1 and 0.6;

(c) $b/n+a+b$ of between 0.02 and 0.85; and

(d) $a/n+a+b$ of between 0.05 and 0.88,

wherein

n is the number of polyisocyanate molecules,

N is the number of NCO functions per molecule,

a is the number of condensation product (A) molecules,

b is the number of polyol (B) molecules,

α is the number of mobile hydrogen functions per molecule of condensation product (A), and

β is the number of mobile hydrogen functions per molecule of polyol (B).

4,600,731

PASTE COMPOSITION CONTAINING AN ORGANOPOLYSILOXANE, PLATINUM AND FILLER

Eckhart Louis; Wolfgang Hechtl, and Heinz Hefner, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 25, 1985, Ser. No. 705,163

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409139

Int. Cl.[4] A61K *6/10*

U.S. Cl. 523—109 **6 Claims**

1. A paste composition containing platinum, an organopolysiloxane an filler which is combined with a triorganosiloxy terminated diorganopolysiloxane having SiC-bonded vinyl groups in each terminal unit, an organopolysiloxane containing at least 3 Si-bonded hydrogen atoms per molecule, and filler to form a dental impression composition, in which the past composition contains

(a) at least 100 ppm by weight of platinum, calculated as the element and based on the weight of the paste composition;

(b) 35 to 75 percent by weight, based on the weight of the paste composition, of a diorganopolysiloxane containing at least 2 SiC-bonded vinyl groups in each molecule and having a viscosity of at least 100 mPa.s at 25° C.;

(c) 10 to 25 percent by weight, based on the weight of the paste composition, of a hydrocarbon which is liquid or spreadable at room temperature and is free of aliphatic carbon-carbon multiple bonds; and

(d) 3 to 15 percent by weight based on the weight of the paste composition, of hydrophobic silicon dioxide having a surface area of at least 50 m^2/g;

in which the sum of the percentages in the paste composition including paste additives is equal to 100 percent.

4,600,732

POLYBENZIMIDAZOLE POLYMER AND POWDER FILLER REINFORCED ELASTOMERIC COMPOSITION FOR USE AS A ROCKET MOTOR INSULATION

Kenneth E. Junior, Madison; James D. Byrd, and James O. Hightower, Jr., both of Huntsville, all of Ala., assignors to Thiokol Corporation, Chicago, Ill.

Filed Dec. 16, 1983, Ser. No. 562,332

Int. Cl.[4] C08K *3/36, 3/22*

U.S. Cl. 523—138 **8 Claims**

1. A method of insulating a solid propellant rocket motor casing, comprising the step of applying to the interior surface of said rocket motor casing an elastomeric insulation comprising:

A. from about 1 to about 40 percent by weight of polybenzimidazole polymer fibers;

B. from about 1 to about 75 percent by weight of a powder filler; and

C. a vulcanizable elastomeric composition.

4,600,733

DISINTEGRATION ASSISTANT FOR CASTING MOLDS

Keizi Ohashi, Urayasu, and Kazuo Takahashi, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 28, 1985, Ser. No. 706,753

Claims priority, application Japan, Feb. 29, 1984, 59-37473

Int. Cl.[4] B22C *11/22*

U.S. Cl. 523—144 **6 Claims**

1. A molding composition for forming a mold and a core for casting, said molding composition comprising foundry sand, a binder for binding said foundry sand, said binder including as a major part a condensation-reactive compound having at least one methylol group in a molecule, a disintegration assistant for improving disintegration characteristics of the mold and the core produced by binding said foundry sand with said binder, said disintegration assistant including at least one compound selected from the group consisting of calcium hydroxide, cal-

cium carbonate, barium hydroxide, and barium carbonate, and a compound capable of generating gas upon heating at a temperature ranging from about 200° to about 400° C.

4,600,734

RUBBER MIXTURES AND MOULDINGS PRODUCED THEREFROM BY VULCANIZATION

Wulf von Bonin, Leverkusen, and Gerd Matenar, Grafing, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,200

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1984, 3402309

Int. Cl.[4] C08L *21/00;* C08K *5/52, 3/10;* H01B *3/28*

U.S. Cl. 523—179 3 Claims

1. Rubber mixtures containing a flame-retarding and intumescence-providing filler, wherein the rubber is an ethylene-copolymer and the flame-retarding and intumescence-providing filler consists essentially of melamine phosphate and aluminum hydroxide.

4,600,735

SOIL-REPELLENT COATING COMPOSITION

Bernt Larsson, Hisings Backa; Gunilla Nobelius, Kungalv, and Elisabet Johansson, Goteborg, all of Sweden, assignors to EKA AB, Surte, Sweden

Filed Feb. 15, 1985, Ser. No. 701,928

Claims priority, application Sweden, Feb. 17, 1984, 8400864

Int. Cl.[4] C08K *3/36, 5/06, 9/04;* D06M *11/06*

U.S. Cl. 523—216 10 Claims

1. A soil-repellent coating composition in an aqueous carrier medium comprising:

(a) 0.5–30% by weight, based on the total weight of the composition, of silica in the form of an alkali stabilized silica sol having an average particle size 4–30 nm,

(b) 0.01–6% by weight, based on the total weight of the composition, of polyvinyl alcohol, the weight ratio of silica to polyvinyl alcohol being higher than 3:1, and

(c) 0.05–2.5% by weight of a wetting agent, selected from the class consisting of nonionic and anionic wetting agents, based on the total weight of the composition.

4,600,736

PIGMENT CONCENTRATES FOR RESINS

Donald G. Needham, Ramona, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1985, Ser. No. 710,887

Int. Cl.[4] C08K *5/01, 5/52;* C08J *3/20*

U.S. Cl. 523—351 20 Claims

1. A resinous pigment concentrate comprising a major portion of a resinous polymer containing at least one polymerized conjugated diene monomer in proportions in the range from about 5 to about 40 weight percent, based upon the total resinous polymer; a minor portion of at least one pigment, and a dispersing additive comprising a partial ester of phosphoric acid and a naphthenic extender oil.

4,600,737

WATER DILUTABLE ACRYLATED EPOXY-PHENOLIC COATING COMPOSITIONS

Nick Georgalas, Brooklyn; John G. Pucknat, New York, both of N.Y., and Ralph R. Villano, Highland Lakes, N.J., assignors to Inmont Corporation, Clifton, N.J.

Division of Ser. No. 563,846, Dec. 21, 1983. This application Mar. 29, 1985, Ser. No. 717,617

Int. Cl.[4] B65D *8/00;* C09D *3/54, 3/58, 3/81*

U.S. Cl. 523—414 6 Claims

1. A water dilutable, storage stable coating composition comprising an organic solvent-containing aqueous solution of the reaction products of a high molecular weight epoxy resin, a phenolic resin, and a plurality of acrylic monomers at least one of which is an acid, said composition reacted in water miscible organic solvent and neutralized with aqueous amine, wherein the acrylic monomers are polymerized in the presence of the epoxy resin and phenolic resin such that the reaction product comprises graft copolymers.

4,600,738

TWO-COMPONENT ACRYLIC MODIFIED POLYESTER ADHESIVE

Foster P. Lamm, South Windsor, and Roscoe A. Pike, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 591,729, Mar. 21, 1984, abandoned. This application Jun. 27, 1985, Ser. No. 749,139

Int. Cl.[4] C08L *67/00;* C08K *3/22*

U.S. Cl. 523—500 5 Claims

1. A two-component acrylic modified polyester adhesive comprising:

a first component having an acrylic modified polyester, which is a reaction product of a glycidyl acrylate and a hydroxyl containing polyester, containing about 0.1% to about 0.5% by weight peroxide, and

a second component comprising an organometallic acid salt dissolved in a polymerizable organic monomer, wherein said organometallic acid salt comprises about 0.1% to about 0.5% by weight of the monomer.

4,600,739

FAST SETTING STARCH-BASED CORRUGATING ADHESIVE HAVING PARTIALLY HYDROLYZED WATER SOLUBLE POLYVINYL ALCOHOL COMPONENT

Paul L. Krankkala, 7821 Rimbley Rd., Woodbury, Minn. 55125

Continuation of Ser. No. 612,359, May 21, 1984, abandoned. This application Jul. 2, 1985, Ser. No. 751,462

Int. Cl.[4] C08L *3/02*

U.S. Cl. 524—48 17 Claims

17. An aqueous, fast setting corrugating adhesive composition which consists essentially of, in a silicate-free aqueous emulsion, a major proportion of water, about 5 to 50 parts of starch per each 100 parts of adhesive, about 0.2 to 0.75 parts by weight of sodium hydroxide per each 100 parts of the adhesive, about 0.01 to 1.5 parts by weight of a cold water soluble polyvinyl alcohol composition having a degree of hydrolysis of about 87 to 89%, wherein the particle size of the polyvinyl alcohol is less than about 80 mesh, about 0.1 to 5 parts of a boric acid compound per each 100 parts of water, wherein the starch is present in the form of an ungelatinized starch phase suspended in a carrier phase of gelatinized starch in an aqueous emulsion having about 0.1 to 10 parts of gelatinized starch and about 0.01 to 40 parts of ungelatinized starch, wherein the polyvinyl alcohol composition is a low molecular weight polyvinyl alcohol which is a 4 wt-% aqueous solution has a Brookfield viscosity of about 4–10 cP at 20° C.

4,600,740

HINDERED DYDROXYBENZYL HEXAALKYLDIPHENYL-METHANES AND STABILIZED COMPOSITIONS

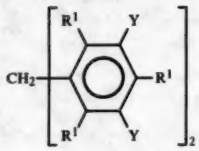
John F. Stephen, West Chester, Pa.; Jerry H. Smith, and Makram H. Meshreki, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Aug. 15, 1985, Ser. No. 765,671

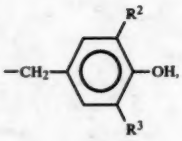
Int. Cl.[4] C07C *39/12;* C08K *5/13*

U.S. Cl. 524—120 5 Claims

1. A compound of the general formula:



where Y is



and wherein R^1 groups are alkyl having 1 to 8 carbon atoms and R^2 and R^3 are alkyl groups of 1 to 8 carbon atoms.

3. A composition comprising a polymer derived from an ethylenically unsaturated monomer and 0.005–5% by weight of a compound of claim 1.

4,600,741

POLYPHENYLENE ETHER-POLYAMIDE BLENDS

David F. Aycock, Glenmont, and Sai-Pei Ting, Delmar, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Filed Sep. 27, 1984, Ser. No. 654,922
Int. Cl.[4] C08L 71/04, 77/06
U.S. Cl. 524—139 21 Claims

1. A thermoplastic composition comprising
(a) a first polyphenylene ether resin;
(b) a polyamide resin; and
(c) a compatibilization agent which is a second polyphenylene ether modified with an acyl functional compound wherein said acyl functional compound contains in its molecule both (i) at least one group having the formula

where X is F, Cl, Br, I, OH,

where R is H or an alkyl or aryl radical and (ii) at least one carboxylic acid, acid anhydride, acid amide, imido, carboxylic acid ester, amino or hydroxyl group; wherein groups (i) and (ii) are covalently bonded through a divalent hydrocarbon radical and are not both simultaneously a COOH group; and wherein compound (c) is presentin an amount sufficient to effect compatibilization of resinous components (a) and (b).

19. A composition as in claim 1 wherein the composition further comprises a phosphate compound.

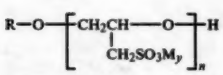
4,600,742

POLYCARBONATE COMPOSITIONS

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Aug. 17, 1984, Ser. No. 641,892
Int. Cl.[4] C08K 5/42
U.S. Cl. 524—166 21 Claims

1. A carbonate polymer composition comprising a mixture of
(A) an aromatic organic carbonate polymer, and
(B) at least about 0.001% by weight of at least one metal sulfonate which is compatible with the aromatic carbonate polymer and which sulfonates are characterized by the formula



(I)

wherein
R is an aliphatic group containing up to about 24 carbon atoms,
M is an alkali or alkaline earth metal,
'n is a number from 1 up to and including 4
Y is equal to 1 when M is an alkali metal and ½ when M is an alkaline earth metal.

4,600,743

ANTISTATIC FIBER CONTAINING POLYOXYALKYLENE GLYCOL

Tatsuhiko Shizuki; Kaoru Ban; Fumikazu Yoshida, and Masakatsu Ohguchi, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Apr. 13, 1984, Ser. No. 600,054
Claims priority, application Japan, Apr. 14, 1983, 58-666431; May 9, 1983, 58-81516
Int. Cl.[4] C08L 67/02, 77/06
U.S. Cl. 524—377 12 Claims

1. An antistatic fiber obtained by melt spinning of a fiber-forming thermoplastic polymer containing at least one of polyoxyalkylene glycol and its derivatives in an amount of not less than 0.5% by weight, characterized in that said fiber has a half life time of electric charge leakage of not more than 150 seconds before and after treatment with a weight decreasing agent and, when treated with a weight decreasing agent, provides a number of streaks arranged in parallel in the lengthwise direction at the surface.

4,600,744

PROCESS FOR THE PREPARATION OF CLAY MINERAL-CONTAINING GELS WITH STABILIZED STRUCTURE AND REVERSIBLE WATER ABSORPTION ABILITY

Oszkár Líbor; Gábor Nagy, and Tamás Székely, all of Budapest, Hungary, assignors to MTA Termeszettudomanyi Kutato Laboratoriumai, Budapest, Hungary

Filed Oct. 25, 1984, Ser. No. 664,843
Claims priority, application Hungary, Aug. 6, 1984, 1680/83
Int. Cl.[4] C08K 3/34
U.S. Cl. 524—446 11 Claims

1. A process for the preparation of clay mineral-containing non-thixotropic gels with stabilized structure and reversible water absorption ability, characterized in that
(a) the resistance of medium of an aqueous suspension sample containing a thixotropic, activated, swelling clay mineral of three-layer structure and/or swelling chain silicate is measured, thereafter in a series of tests a water soluble polymer capable of reacting with the clay mineral and/or chain silicate is added to the suspension samples either as such or in an aqueous solution, the resistance of medium of the resulting mixtures is measured, and the clay mineral:-

polymer:water ratios are determined at which the resistance of medium of the suspension is at least ten times higher than that of the initial, polymer-free suspension, whereby the useful limits are obtained, then

(b_1) the clay mineral and/or chain silicate is contacted with the polymer in a ratio falling within the useful limits, in the presence of an amount of water within the useful limits, or

(b_2) the clay mineral and/or chain silicate is contacted with the polymer in a ratio within or outside the useful limits, in the presence of more water than that corresponding to the useful limits, the water content of the resulting flocculate is then decreased mechanically to fall within the useful limits, and, if necessary, the clay mineral:polymer ratio of the mass is adjusted simultaneously within the useful limits by adding further amount(s) of clay mineral or chain silicate and/or polymer to the mass,

and, if desired, the resulting gel is partially or totally dried, whereafter, if desired, the partially or totally dried gel is reacted in an aqueous medium with a polymer capable of reacting with the clay mineral or chain silicate under keeping the clay mineral:polymer ratio still within the useful limits.

4,600,745

ADHESIVE COMPOSITIONS

Edward Creighton, Stafford, England, assignor to Evode Limited, Stafford, England

Continuation of Ser. No. 503,565, Jun. 13, 1983, abandoned. This application Jul. 8, 1985, Ser. No. 752,014

Claims priority, application United Kingdom, Jun. 17, 1982, 8217501

Int. Cl.[4] C08L *9/00*; **C08K** *3/20, 3/26*; **C08J** *3/24*

U.S. Cl. 524—534 **9 Claims**

1. An adhesive composition which is in the form of a paste and which comprises a vulcanizable component, powdered sulfur, an accelerator system and a filler system, at least about 83 percent by weight of the vulcanizable component being a liquid polybutadiene polymer specimen having an average molecular weight in the range of 1,000 to 10,000, a viscosity in the range of 2 to 800 dPas at 25° C. and at least 40 percent of the unsaturation in the 1,4 configuration; said vulcanizable component constituting 100 parts by weight of the composition; said powdered sulfur constituting 5 to 60 parts by weight of the composition; said accelerator system constituting 2.5 to 70 parts by weight of the composition; and said filler system, which comprises at least one inert filler, constituting up to 80 percent by weight of the composition.

4,600,746

POLYVINYL ALCOHOL ALLOYS AND METHOD OF MAKING THE SAME

Seymour Schmukler, Palatine; Mitsuzo Shida, Barrington, and John Machonis, Jr., Schaumburg, all of Ill., assignors to Norchem, Inc., Rolling Meadows, Ill.

Division of Ser. No. 578,111, Feb. 8, 1984, Pat. No. 4,575,532. This application Oct. 11, 1985, Ser. No. 786,513

Int. Cl.[4] C08L *29/04*

U.S. Cl. 525—57 **20 Claims**

1. A melt processable polymer alloy prepared by the method comprising the steps of:

(a) providing a polyvinyl alcohol polymer having a degree of hydrolysis of less than about 90 mole percent and a degree of polymerization of about 300 to 900, inclusive;

(b) providing a functional polymer comprising a polyolefin or an ethylene-ester copolymer having functional groups reactive with the hydroxyl groups of said polyvinyl alcohol polymer incorporated therein by copolymerization, said functional groups comprising one or more of a carboxylic acid, a carboxylic acid anhydride, a metal salt of a carboxylic acid, or a derivative thereof; and,

(c) thereafter reacting said polyvinyl alcohol polymer with less than a stoichiometric amount of said functional polymer to provide a mixture of grafted and ungrafted polyvinyl alcohol polymers, said grafted polyvinyl alcohol polymer having less than all available hydroxyl groups reacted with said functional groups, said polyvinyl alcohol polymer comprising at least about 70 weight percent of said mixture.

4,600,747

ABS-MOULDING COMPOSITIONS WITH IMPROVED FLAME RESISTANCE

Karl Zabrocki, Buettgen; Christian Lindner, Cologne; Friedmann Müller, Neuss, and Joachim Döring, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 647,452, Sep. 5, 1984, abandoned. This application Apr. 18, 1985, Ser. No. 724,753

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333722

Int. Cl.[4] C08L *51/04, 55/02*

U.S. Cl. 525—83 **5 Claims**

1. In an improved ABS-moulding composition comprising

I. from 90 to 30% by weight of one or more thermoplastic copolymers comprising

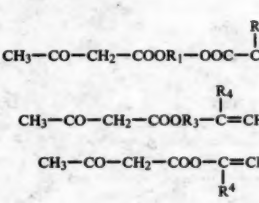
(Ia) from 50 to 80% by weight of styrene, α-methylstyrene, nucleus-alkylated styrene, halogen styrene, maleic acid anhydride, N-substituted or unsubstituted maleic imide, methyl methacrylate, indene or a mixture of two or more of these monomers,

(Ib) from 35 to 15% by weight of acrylonitrile, methacrylonitrile or mixtures thereof, and

(Ic) from 20 to 0.2% by weight of at least one additional copolymerizable compound, and

II. from 10 to 70% by weight of at least one graft polymer, obtainable by polymerization of one or more monomers from one or more of the groups (Ia), (Ib), (Ic), in the presence of at least one diene containing rubber polymer, with the percentages by weight of I and II being based on the sum of I and II,

the improvement comprises said additional copolymerizable compound (Ic) is of the formula



wherein

R_1 represents a C_2–C_6-alkylene,

R_2 represents hydrogen or methyl,

R_3 represents a C_1–C_4-alkylene, and

R_4 represents hydrogen, methyl or CH_2—OOC—CH_2—CO—CH_3 and the total quantity of (Ic) not exceeding 25% by weight, based on the moulding composition.

4,600,748

POLYOLEFIN COMPOSITION

Kaneyuki Takagi, Tokyo; Yoichi Kawai, Yokohama, and Yoshiyasu Kamiya, Kawasaki, all of Japan, assignors to Daiwa Company Limited and Mitsui Toatsu Chemicals Inc., both of Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,525

Int. Cl.[4] C08L *77/02*

U.S. Cl. 525—133 **12 Claims**

1. A polyolefin composition comprising: 100 parts by weight of polyolefin, not less than 0.5 part by weight of a polyamide selected from the group consisting of nylon 6 and nylon 66, and

from 3 to 30 percent by weight of a novolak based on the weight of the polyamide.

4,600,749

THERMOPLASTIC ELASTOMERS

Saburo Minekawa, Yokohama; Koretaka Yamaguchi, Kawasaki; Kazuo Toyomoto; Einosuke Fujimoto, both of Yokohama; Norikatu Nakayama, and Shikazo Senoh, both of Kawasaki, all of Japan, assignors to Asahi Kasej Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 42,028, May 24, 1979, abandoned, which is a continuation of Ser. No. 850,070, Nov. 3, 1977, abandoned, which is a continuation of Ser. No. 675,212, Apr. 8, 1976, abandoned, which is a continuation of Ser. No. 259,760, Jun. 5, 1972, abandoned, which is a continuation of Ser. No. 15,210, Feb. 20, 1970, abandoned, which is a division of Ser. No. 603,120, Dec. 20, 1966, abandoned. This application Feb. 12, 1982, Ser. No. 348,335

Claims priority, application Japan, Dec. 29, 1965, 40-80952

Int. Cl.[4] C08F *297/04*

U.S. Cl. 525—314 4 Claims

1. Thermoplastic block copolymer elastomer of conjugated diolefins having 4 to 6 carbon atoms and monovinyl aromatic hydrocarbons, prepared by polymerizing a first charge of 8 to 65 parts by weight of a monomer mixture A_1 comprising a conjugated diolefin having 4 to 6 carbon atoms and a monovinyl aromatic hydrocarbon in a weight ratio of 85–10:15–90 in a hydrocarbon solvent and an inert atmosphere in the presence of 0.2 to 20 mmol. per 100 g. of the total amount of the mixture A_1 and the mixture A_2 described below, of a monolithium hydrocarbon calculated as active lithium to form an active copolymer, and after substantial completion of the polymerization of the first charge, copolymerizing said active copolymer with a second charge of 92 to 35 parts by weight of a monomer mixture A_2 comprising the same conjugated diolefin having 4 to 6 carbon atoms and monovinyl aromatic hydrocarbon as said mixture A_1 in a weight ratio of 95–20:5–80, such that the total amount of said mixtures A_1 and A_2 is 100 parts by weight, to thereby obtain a final copolymer having a monovinyl aromatic content of 10 to 70% by weight based on the total amount of said mixtures A_1 and A_2.

4,600,750

PROCESS FOR PREPARING POLYMERIC ACETAL CARBOXYLATES

David R. Dyroff, Ladue; Edward J. Burke, St. Louis; William Vanderlinde, Creve Coeur, and Thomas W. Backes, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 27, 1985, Ser. No. 769,839

Int. Cl.[4] C08G *6/00;* C08L *61/02*

U.S. Cl. 525—398 39 Claims

1. In a process for producing a polymeric acetal carboxylate salt comprising the steps of:

(a) bringing together in a reaction zone under polymerization conditions an ester of glyoxylic acid and a polymerization promoter, to produce a polymeric acetal ester;

(b) adding to said polymeric acetal ester a stabilizing endgroup precursor to add stabilizing endgroups to the polymeric acetal ester to produce a stablized polymeric acetal ester; and

(c) saponifying said stabilized polymeric acetal ester with an alkali metal hydroxide to produce the corresponding alkali metal polymeric acetal carboxylate salt;

the improvement which comprises providing step (c) with a polymer wherein the number of polymer chains which contain at least one unstable temporary endcap does not exceed about 25% of the total number of polymer chains entering step (c), whereby the active yield of alkali metal polymeric acetal carboxylate salt is at least about 75% based upon the amount of said ester of glyoxylic acid.

4,600,751

HYDROPHILIC SILICONE-ORGANIC COPOLYMER ELASTOMERS

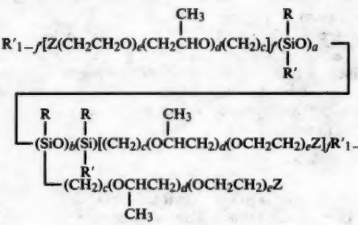
Chi-long Lee, Midland, Mich., and Wen-Bin Shyu, Chagrin Falls, Ohio, assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 18, 1984, Ser. No. 683,308

Int. Cl.[4] C08L *83/12*

U.S. Cl. 525—404 24 Claims

1. A composition curable to a water-absorbing hydrophilic silicone-organic copolymer elastomer consisting essentially of (A) from 50 to 95 parts by weight of at least one block copolymer of the formula



wherein

a is an integer of from 4 to 49, inclusive,

b is an integer of from 0 to 15, inclusive,

c is an integer having a value of from 2 to 4, inclusive,

d is an integer of from 0 to 25, inclusive,

e is an integer of from 5 to 50 inclusive

d+e is no greater than 50 and e is greater than or equal to d,

f is 0 or 1,

f' is 0 or 1,

f+f'+b is at least 2,

R is a monovalent hydrocarbon or halohydrocarbon radical of from 1 to 6 inclusive carbon atoms which is free of aliphatic unsaturation,

R' is a methyl or a phenyl radical,

Z is a monovalent radical selected from the group consisting of $CH_2{=}CR''COOR'''NHCOO-$, and $CH_2{=}CR''COO-$,

R'' is an alkyl radical of from 1 to 4 inclusive carbon atoms or hydrogen,

R'''is a divalent hydrocarbon radical of from 1 to 6 inclusive carbon atoms, and

(B) from 5 to 50 parts by weight of at least one substantially water insoluble aliphatically unsaturated organic monomer which is compatible with said (A), wherein upon curing said composition, an elastomer is obtained which is hydrophilic and capable of absorbing at least 3% by weight of water based upon the total weight of said elastomer before exposure to water.

4,600,752

EASY-FLOWING IMPACT-RESISTANT POLYAMIDE MODIFIED WITH OXYCARBONYL ISOCYANATE

Rolf-Volker Meyer; Rolf Dhein; Bert Brassat, all of Krefeld, and Hermann Hagemann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 275,041, Jun. 18, 1981, abandoned. This application Mar. 14, 1985, Ser. No. 711,675

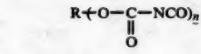
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1980, 3023918

Int. Cl.[4] C08G *69/46*

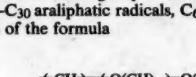
U.S. Cl. 525—424 6 Claims

1. A thermoplastic, easy-flowing polyamide selected from polylactam of a lactam having from 6 to 12 carbon atoms in the lactam ring, polycondensate of diamine and dicarboxylic acid

or mixtures thereof modified by incorporating therein at least one oxycarbonyl isocyanate of the formula



wherein n is an integer of from 1 to 4 and R is an n-valent radical selected from the group consisting of C_1–C_{20} aliphatic radicals, C_7–C_{30} araliphatic radicals, C_6–C_{22} aromatic radicals and radicals of the formula



wherein R′ is independently hydrogen or a C_1–C_4 alkyl radical, m is an integer of from 2 to 4 and n′ is an integer of from 1 to 200.

4,600,753

TWO STAGE PROCESS FOR THE PRODUCTION OF AROMATIC POLYESTER-CARBONATE

Dieter Freitag; Claus H. Wulff, both of Krefeld; Gerhard Henes, Leverkusen; Ludwig Bottenbruch, and Peter Tacke, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 680,156

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3346945

Int. Cl.[4] C08G *63/64*

U.S. Cl. 525—439 7 Claims

1. A process for the production of an aromatic polyester-carbonate in which, in a first stage a diaryl ester of at least one aromatic dicarboxylic acid, or a mixture of at least one aromatic dicarboxylic acid and diphenyl carbonate, is reacted with 1.01 to 100 moles of at least one diphenol, per mole of diaryl ester, in the melt until an oligomer having a number-average molecular weight of 650 to 25,000 has been produced and thereafter, in a second stage, the oligomer is condensed with phosgene, using the phase boundary process, in the presence of a tertiary amine, a quaternary ammonium salt or a mixture of both to give the aromatic polyester-carbonate.

4,600,754

PHOSPHATE EPOXY ACRYLIC COPOLYMERS

Peter P. Winner, North Royalton, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 495,703, May 18, 1983. This application May 10, 1984, Ser. No. 608,903

Int. Cl.[4] C08F *283/10*

U.S. Cl. 525—531 39 Claims

1. In a process for polymerizing ethylenically unsaturated monomers in the presence of epoxy resin, the improvement comprising:

reacting an epoxy resin having epoxide groups and having a molecular weight between about 350 and 20,000 with a source of phosphoric acid selected from 100% ortho phosphoric acid, aqueous phosphoric acid or polyphosphoric acid to coreact phosphoric acid with the epoxy resin epoxide groups to produce a phosphated epoxy polymer containing by weight between about 0.5% and 5% coreacted phosphoric acid;

polymerizing ethylenically unsaturated monomers, at least one being a carboxyl functional monomer, in the presence of said phosphated epoxy polymer and in the presence of at least 3% by weight of benzoyl peroxide based on the weight of ethylenically unsaturated monomers, or under equivalent free radical initiating conditions using a peroxide initiator, at temperatures between about 80° C. and 130° C., to provide an in-situ formed polymerization product comprising on a weight basis between about 10% and 90% phosphated epoxy polymer, and the remaining being carboxyl functional addition polymer of polymerized monomers wherein the acid functionality of the addition polymer is sufficiently high to render the polymerization product water dispersible.

4,600,755

FREE RADICAL INITIATED POLYMERIZATION OF POLYMERIZABLE ETHYLENICALLY UNSATURATED MONOMER COMPONENT IN THE PRESENCE OF HYDROGEN PEROXIDE

Suryya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 3, 1985, Ser. No. 719,661

Int. Cl.[4] C08F *4/30*

U.S. Cl. 526—81 16 Claims

1. A method of preparing a free radical initiated addition polymer by polymerizing a polymerizable ethylenically unsaturated monomer component in the presence of a solution of hydrogen peroxide characterized in adding an aqueous hydrogen peroxide solution to the polymerizing monomer component incrementally throughout the course of the polymerization and simultaneously removing low boiling organic solvents and water from the polymerizing monomer component as the aqueous hydrogen peroxide solution is being added; the resulting free radical initiated addition polymer having a number average molecular weight of no greater than 8000.

4,600,756

HIGH-ORIENTABILITY POLYACETYLENE FILMS AND PROCESS FOR THEIR PRODUCTION

Ugo Pedretti; Giovanni Perego, both of Milan, and Gabriele Lugli, San Donato Milanese, all of Italy, assignors to Enichimica S.p.A., Milan, Italy

Filed Jul. 29, 1983, Ser. No. 518,397

Claims priority, application Italy, Aug. 3, 1982, 22722 A/82; May 27, 1983, 21349 A/83

Int. Cl.[4] C08F *38/02*

U.S. Cl. 526—134 10 Claims

1. A process for producing a polyacetylene film having:

(a) a thickness from 5 microns to 1 mm;

(b) a content of cis isomer greater than about 40%;

(c) an elongation at break (L/LO) which at 25° C. is in the range of 4 to about 7.5;

(d) A tensile strength over 100 MPa;

(e) a molecular orientation under stretch such as to produce scattering of X-rays, $\Delta\beta$ being equal to our lower than 35°;

said process comprising polymerizing acetylene in film form at a temperature of from −100° C. to +100° C. and under an acetylene pressure of from 0.01 atmosphere to 2 atomospheres by directly contacting monomeric acetylene with a two component catalyst system which consists of

(1) a member of the group consisting of:

$Ti(N(norC_3H_7)_2)_4$

$Ti(N(norC_3H_7)_2)_2$

$((O\text{-}norC_4H_9)_2)$

$Ti(N(norC_3H_7)_2)_2$

$((CH_3COO)_2)$

$Ti(N(norC_3H_7)_2)_2$

$((O—C_6H_4—CH_3)_2)$

$Ti(N(C_{17}H_{33}COO)_2)$

$((O—C_6H_4—CH_3)_2)$

$Ti((O—C_6H_4—CH_3)_2)$

$((O\text{-}norC_4H_9)_2)$

$Ti(N(norC_3H_7)_2)_2$

$((S—C_6H_5)_2)$

$Ti((O—C_6H_4—O))$

$((O\text{-}norC_4H_9)_2)$;

and

(2) a member of the group consisting of: sodium alkyls, lithium alkyls, potassium alkyls, beryllium alkyls, magnesium alkyls, magnesium alkyl halides, zinc alkyls, boron alkyls, aluminum alkyls, gallium alkyls, tin alkyls and lead alkyls, wherein said alkyls have from 1 to 8 carbon atoms.

4,600,757

PROCESS FOR THE PREPARATION OF POLYISOPRENE

John C. Chadwick, Amsterdam, Netherlands, and Brian L. Goodall, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 542,817, Oct. 17, 1983, abandoned. This application Apr. 18, 1985, Ser. No. 725,196

Claims priority, application Netherlands, Oct. 27, 1982, 8204147

Int. Cl.[4] C08F *4/64, 36/08*

U.S. Cl. 526—142 **9 Claims**

1. A process for the preparation of polyisoprene by polymerizing a mixture of isoprene in an inert diluent in the presence of a beta-$TiCl_3$ containing catalyst, diethylaluminum chloride and an activator, characterized in that the said activator is prepared by reacting a hydrocarbylaluminum compound with a hydroxy-aromatic compound containing in both ortho positions relative to the hydroxyl group a secondary or tertiary alkyl group, wherein

(a) the molar ratio of the hydroxy-aromatic compound to the hydrocarbylaluminum compound is between 0.5:1 and 2:1;

(b) the hydroxy-aromatic compound is a 2,6-di-tert-alkylhydroxybenzene compound;

(c) the polymerization is effected at a temperature between 35° C. and 60° C.;

(d) the molar ratio of activator to beta-$TiCl_3$ after mixing the activator and catalyst together is between 0.05:1 and 1.0:1;

(e) said beta-$TiCl_3$ catalyst being obtained by mixing a Lewis base with a trihydrocarbyl aluminum compound (AlR_3) and $TiCl_4$;

(f) said hydrocarbylaluminum compound being selected from the group consisting of diethylaluminum chloride and triethyl aluminum; and

(g) said diethylaluminum chloride in said mixture being present at a concentration of 0.01 to 10 milimoles per liter of mixture.

4,600,758

ISOINDOLE DERIVATIVES

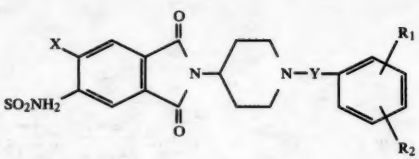
Terence M. Dolak, and Tellis A. Martin, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 441,204, Nov. 12, 1982, Pat. No. 4,495,194. This application Nov. 1, 1984, Ser. No. 667,779

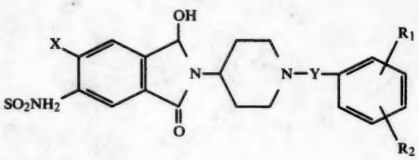
Int. Cl.[4] C07D *401/04*

U.S. Cl. 546—200 **3 Claims**

1. A compound of Formula II or III



(II)



(III)

wherein

X is halogen or trifluoromethyl;

R_1 and R_2 are independently hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkylthio, trifluoromethyl, cyano, nitro;

Y represents a single bond or a divalent alkylene radical of 1 to 4 carbon atoms.

4,600,759

PROCESS FOR MAKING COPOLYMERS OF VINYLPYRROLIDONE AND MALEIC ANHYDRIDE

Eugene S. Barabas, Watchung, N.J., assignor to Gaf Corporation, Wayne, N.J.

Filed Dec. 10, 1984, Ser. No. 679,780

Int. Cl.[4] C08F *222/06, 226/10*

U.S. Cl. 526—207 **6 Claims**

1. In a process for copolymerization of vinylpyrrolidone and maleic anhydride in the presence of catalyst and organic solvent for the vinylpyrrolidone and maleic anhydride monomers, in which solvent the resulting copolymer is insoluble, the improvement which comprises conducting such copolymerization in the presence of between about 0.1 and about 1.0 weight % water.

4,600,760

THERMOSETTABLE RESIN COMPOSITION CONTAINING ALKENYL PHENYL CYANATE

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 639,035, Aug. 9, 1984, abandoned. This application Apr. 11, 1985, Ser. No. 721,990

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

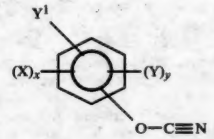
Int. Cl.[4] C08F *220/52;* C08L *33/24*

U.S. Cl. 526—262 **16 Claims**

1. A thermosettable composition which comprises

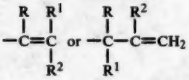
(A) at least one alkenyl phenyl cyanate containing at least 10 percent by weight of monomeric material represented by formula I

FORMULA I



wherein each R, R^1 and R^2 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each X is independently hydrogen, a hydro-

carbyl group or a hydrocarbyloxy having from 1 to about 10 carbon atoms, chlorine or bromine; each Y is independently hydrogen or a hydrocarbyl group having from 1 to about 10 carbon atoms; Y^1 is a



group and x and y are positive integers and the sum of x plus y has a value of 4; and

(B) at least one of

(1) at least one aromatic polycyanate,

(2) at least one polymaleimide, or

(3) at least one polymerizable ethylenically unsaturated aromatic compound;

wherein component A comprises from about 1 to about 99 percent by weight of the combined weight of components A and B; with the proviso that component (B-3) is not used alone with component (A).

4,600,761

ACRYLIC EMULSION COPOLYMERS FOR THICKENING AQUEOUS SYSTEMS AND COPOLYMERIZABLE SURFACTANT MONOMERS FOR USE THEREIN

Charles G. Ruffner, and John M. Wilkerson, III, both of Hamilton County, Tenn., assignors to Alco Chemical Corporation, Chattanooga, Tenn.

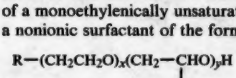
Continuation-in-part of Ser. No. 719,768, Apr. 4, 1985. This application Oct. 1, 1985, Ser. No. 782,571

Int. Cl.[4] C08F *216/14*

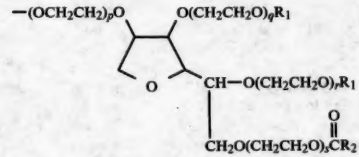
U.S. Cl. 526—270 **26 Claims**

1. A copolymer obtained by aqueous emulsion copolymerization of a monomer system comprising

(A) about 1 to about 25 percent of at least one nonionic urethane monomer which is the urethane reaction product of a monoethylenically unsaturated monoisocyanate with a nonionic surfactant of the formula:



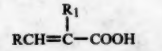
in which x is an integer of from 1 to 150 and y is an integer of from 0 to 40 when R a sorbitan fatty ester of the formula



where each of p, q, r and s is an integer and the sum of said integers is from 0 to 100, R_1 is H or $—COR_2$ and R_2 is alkyl, alkylphenyl, or dialkylphenyl 5 to 30 carbon atoms; or x and y are each integers of from 0 to 40 when R is $—NH(CH_2)_3O—R_3$, or

where R_2 is H or R_3, and R_3 is alkyl, alkylphenyl, or dialkylphenyl of from 5 to 30 carbon atoms;

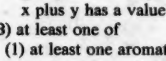
(B) about 5 to about 70 percent of a copolymerizable α,β-ethylenically unsaturated carboxylic acid monomer of the formula



where R is H and R_1 is H, an alkyl group containing from 1 to 4 carbon atoms, or $—CH_2COOX$; R is —COOX and R_1 is H, and X is H or an alkyl group containing from 1 to 4 carbon atoms,

(C) about 10 to to about 90 percent of at least one nonionic, copolymerizable α,β-ethylenically unsaturated monomer of the formula

where Y is H and Z is CN, Cl, —COOR, C_6H_4R,



or $—CH=CH_2$; Y and Z are Cl, and Y is CH_3 and Z is CN,

$—CH=CH_2$, $—C_6H_4R$, or $—COOR_1$, and R is H, Cl, Br or alkyl containing from 1 to 4 carbon atoms; R_1 is alkyl containing from 1 to 12 carbon atoms, or hydroxyalkyl containing from 2 to 8 carbon atoms, and R_2 is alkyl containing from 1 to 8 carbon atoms; and

(D) up to 1 percent of a copolymerizable polyethylenically unsaturated cross-linking monomer, said percentages being by weight, based on the total weight of said monomers.

4,600,762

RANDUM 1-BUTENE COPOLYMER

Kunisuke Fukui, Hiroshima, and Norio Kashiwa, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,069

Claims priority, application Japan, Aug. 12, 1983, 58-146491

Int. Cl.[4] C08F *10/08*

U.S. Cl. 526—348.6 **12 Claims**

1. A random copolymer consisting essentially of 65 to 99 mole % of 1-butene and 35 to 1 mole % of propylene, and having

(A) a boiling methyl acetate-soluble content of not more than 2% by weight based on the weight of the copolymer,

(B) an intrinsic viscosity (η), determined in decalin at 135° C., of 1 to 5 dl/g,

(C) a n-decane/acetone (1:1 by volume) mixture-soluble content in % by weight based on the weight of the copolymer of less than the value calculated by $4\times(\eta)^{-1.2}$,

(D) a DSC melting point, determined by a differential scanning calorimeter, of 50° to 130° C.,

(E) a yield strength, measured by JIS K-7113, of 50 to 300 kg/cm^2,

(F) an elongation at break, measured by JIS K-7113, of 200 to 1000%, and

(G) a tensile strength at break, measured by JIS K-7113, of 150 to 800 kg/cm^2.

4,600,763

INTERPOLYMERS OF BICYCLIC AMIDE ACETALS/DICARBOXYLIC ACID ANHYDRIDES/POLYEPOXIDES

Anil Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 5, 1985, Ser. No. 772,821

Int. Cl.[4] C08G *59/40*

U.S. Cl. 528—111 **8 Claims**

1. The process comprising the interpolymerization of a bicyclic amide acetal, a dicarboxylic acid anhydride and a polyepoxide in the temperature range of from 80° C. to about 200° C. at a pressure in the range of from about ambient pressure to about 50 atmospheres.

4,600,764

THERMOTROPIC AROMATIC POLYESTERS WITH GOOD RIGIDITY AND TOUGHNESS, PROCESS FOR THE PRODUCTION THEREOF AND THE USE THEREOF FOR THE PRODUCTION OF MOULDINGS, FILAMENTS FIBRES AND FILMS

Hans-Rudolf Dicke; Ludwig Bottenbruch; Dieter Freitag, all of Krefeld, and Aziz E. Sayed, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,268

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1984, 3415530

Int. Cl.[4] C08G *63/60*

U.S. Cl. 528—128 **6 Claims**

1. Thermotropic fully-aromatic polyester comprising co-condensed units of

(a) 50 to 80 mol % p-hydroxybenzoic acid, or p-hydroxybenzoic acid substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, C_6–C_{10} aryl, C_7–C_{12} alkylaryl or halogen,

(b) isophthalic acid or a mixture of isophthalic acid and terephthalic acid,

(c) 15 to 48 mol % hydroquinone, 4,4'-dihydroxydiphenyl, or both and

(d) 2 to 30 mol % 3,4'-dihydroxybenzophenone, 4,4'-dihydroxybenzophenone, or both

wherein the amounts of (a), (c) and (d) are based on the sum of the condensed units (a), (c) and (d) with the mol % of (b) determined by the ratio of the condensed units b/(c+d) which is from 0.95 to 1.05 and the proportion of terephthalic acid units based on the total of units (b) being at most 30 mol %.

4,600,765

MELT PROCESSABLE OPTICALLY ANISOTROPIC POLYMERS

David M. Lee; David A. Hutchings, both of Newark; Gloria M. Sieloff, Pataskala, and G. Fred Willard, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

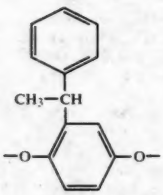
Filed Feb. 17, 1984, Ser. No. 581,166

Int. Cl.[4] C08G *63/18*

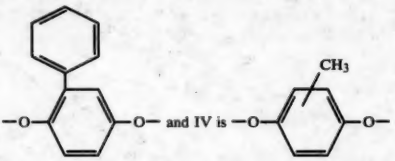
U.S. Cl. 528—193 **9 Claims**

1. A melt spinnable liquid crystal polyester which is optically anistropic in the melt phase and of fiber forming molecular weight consisting essentially of recurring moieties of formulas:

and II.



and moiety III or IV wherein III is



wherein the mole ratio of moiety II to moiety III, when present, is 1:4 to 2:1 and wherein the mole ratio of moiety II to moiety IV, when present, is 2:8 to 1:9.

4,600,766

PROCESS FOR PRODUCING CROSS-LINKED RESIN FROM BIS(2-OXAZOLINE) AND AROMATIC HYDROXY-CARBOXYLIC ACID

Kazuhiro Arita, Takatsuki; Isao Masuda, Shimizu, and Yasuo Sano, Minoo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 660,488

Claims priority, application Japan, Oct. 21, 1983, 58-198121

Int. Cl.[4] C08G *73/00*

U.S. Cl. 528—207 **23 Claims**

1. A process for producing a cross-linked resin which comprises: reacting a bis(2-oxazoline) compound with a reactive compound which has at least one active hydrogen in the molecule, the reactive compound being at least one aromatic hydroxy-carboxylic acid, in a molar ratio of the reactive compound to the bis(2-oxazoline) compound of not more than about 2, at an elevated temperature.

4,600,767

THERMOSTABLE HYDROXYSTYRYLAZA COMPOUNDS

Tim R. Diephouse, Midland, Mich.; Randy J. LaTulip; John W. Robinson, both of Lake Jackson, Tex., and Gary R. Gantt, Brazoria, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 16, 1985, Ser. No. 766,843

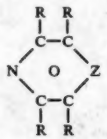
Int. Cl.[4] C08G *12/28, 12/26*

U.S. Cl. 528—252 **8 Claims**

1. Thermostable hydroxystyrylaza compounds which comprise the reaction products of

(A) one or more mono-hydroxy aromatic aldehydes wherein the ortho and para positions from the hydroxy group having no aldehyde group are substituted by groups inert to condensation with alkyl azines, and

(B) one or more alkyl azine compounds having the formula



where Z is N, C—CH^3, C—CH^2—CH^3, or C—H; R is hydrogen, methyl, or ethyl with the proviso that the total number of methyl groups substituted on the azine ring is in the range from 2–4.

4,600,768

AROMATIC POLYESTERS DERIVED FROM 2,3-BUTANEDIOL

Winston J. Jackson, Jr., and Joseph J. Watkins, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 18, 1985, Ser. No. 789,281
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—308 4 Claims

1. Polyesters comprised of repeating units from an aromatic dicarboxylate moiety and 2,3-butanediol wherein at least 50 mol percent of the glycol component is 2,3-butanediol, said polyester having an inherent viscosity of at least 0.4.

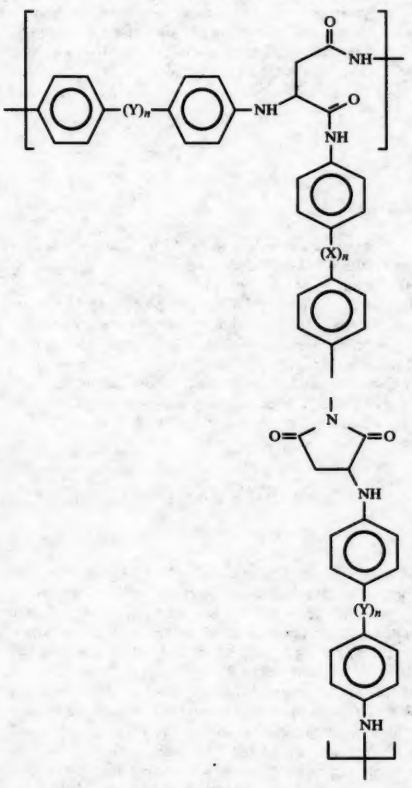
4,600,769

AMINE TERMINATED BISASPARTIMIDE POLYMER

Devendra Kumar, Delhi, India; George M. Fohlen, Millbrae, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 561,702, Dec. 15, 1983, abandoned. This application May 31, 1985, Ser. No. 739,760
Int. Cl.[4] C08G 73/10
U.S. Cl. 528—322 6 Claims

1. An —NH— crosslinked diamine-bismaleimide polymer having two moles of diamine per mole of bismaleimide in recurring structural units of the formula:



wherein X and Y are divalent radicals capable of linking two benzene rings and n is, independently in each case, an integer of 0 or 1.

4,600,770

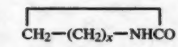
WATER SOLUBLE IMIDE COATING COMPOSITION AND METHOD OF MAKING FROM LACTAM, DIANHYDRIDE AND DIAMINE

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021

Filed Jan. 23, 1985, Ser. No. 694,095
Int. Cl.[4] C08G 69/14, 73/10
U.S. Cl. 528—322 20 Claims

1. The method of preparing a polyimide coating composition which comprises the steps of:

mixing an aromatic dianhydride with an oxoimine having the general formula:



where x is an integer from 4 to 7 in a mole ratio of oxomine to dianhydride between about 0.01:1 and 10:1 to produce a carboxy terminated bisimide; dissolving said imide in a solvent which renders the resulting solution water soluble; adding sufficient water to make at least a 10 wt. % water solution adding thereto aromatic diamine; and adding thereto from about 2 to 20% of the weight of the water of a tertiary amine.

4,600,771

PROCESS FOR THE PREPARATION OF ACYLATED SUGARS WITH A GLYCOSIDICALLY BONDED ISOTHIOCYANATE GROUP

Tillmann Hassel, Cologne, and Hanns P. Müller, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1984, Ser. No. 670,691
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341018
Int. Cl.[4] C07H 5/06
U.S. Cl. 536—22 15 Claims

1. A process for the preparation of an acylated sugar with a glycosidically bonded isothiocyanate group which comprises contacting an acylated sugar having a glycosidically bonded halogen atom with at least 1 equivalent of a thiocyanate of the forula

Me—NCS

wherein

Me denotes an alkali metal, an alkaline earth metal or ammonium, in an inert solvent in which said thiocyanate is virtually insoluble at an elevated temperature in the presence of a phase transfer catalyst having a complexing constant of 170 L/mol to 10^8 L/mol.

4,600,772
CEPHALOSPORIN ANTIBIOTICS

Cynthia H. O'Callaghan, Gerrards Cross; David G. H. Livermore, and Christopher E. Newall, both of London, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 303,121, Sep. 17, 1981, abandoned, which is a continuation of Ser. No. 217,109, Dec. 16, 1980, abandoned, which is a division of Ser. No. 42,594, May 25, 1979, Pat. No. 4,258,041. This application Sep. 13, 1982, Ser. No. 417,656

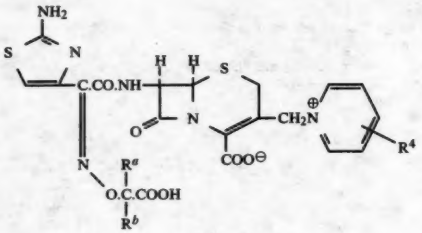
Claims priority, application United Kingdom, May 26, 1978, 22911/78; May 26, 1978, 22913/78

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.[4] C07D *501/38;* A61K *31/545*

U.S. Cl. 544—625 9 Claims

1. A cephalosporin antibiotic selected from the group consisting of compounds of the formula



(I)

wherein R^a and R^b, which may be the same or different, each represent a C_{1-4} alkyl group or R^a and R^b together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene group; and R^4 represents hydrogen or a 3- or 4-carbamoyl group; and non-toxic salts thereof.

4,600,773
CRYSTALLINE CEPHALEXIN HYDROCHLORIDE MONOHYDRATE

Gary L. Engel; Joseph M. Indelicato, both of Greenwood, and Harry A. Rose, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 1, 1983, Ser. No. 556,887

Int. Cl.[4] C07D *501/22*

U.S. Cl. 544—30 10 Claims

1. Crystalline cephalexin hydrochloride ethanol solvate exhibiting essentially the following X-ray diffraction data:

Spacing, d(Å)	Relative Intensities, I/I_1
14.48	1.00
10.04	.005
9.16	.01
8.58	.02
7.34	.095
6.10	.055
5.75	.05
5.48	.175
5.08	.01
4.62	.035
4.32	.035
4.02	.025
3.97	.025
3.78	.01
3.72	.035
3.68	.06
3.43	.01
3.36	.06
3.16	.035
3.04	.035
2.74	.01

-continued

Spacing, d(Å)	Relative Intensities, I/I_1
2.54	.01
2.52	.025
2.45	.01
2.42	.015

4,600,774
CYCLIC SULFOPERFLUOROALIPHATICCARBOXYLIC ACID ANHYDRIDES AND AMIDE DERIVATIVES THEREOF

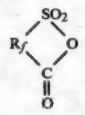
Robert J. Koshar, Mahtomedi, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 326,761, Dec. 2, 1981, abandoned, which is a division of Ser. No. 229,872, Jan. 30, 1981, Pat. No. 4,332,954. This application Jun. 13, 1985, Ser. No. 744,493

Int. Cl.[4] C07C *143/13, 143/74;* C07D *265/28*

U.S. Cl. 544—85 4 Claims

1. Carboxamides and sulfonamides, useful as latent catalysts for the polymerization of cationically-sensitive monomers, prepared by a process comprising reacting at least one cyclic anhydride of an omega-sulfoperfluoroaliphaticcarboxylic acid, said cyclic anhydride having the formula:



wherein R_f is perfluoroalkylene having 2 to 5 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, R_f optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with R_f having a total of up to 14 carbon atoms, with at least one protonic nitrogenous base having a pk_b of less than about 13.2.

2. Carboxamides and sulfonamides, useful as latent catalysts for the polymerization of cationically-sensitive monomers, said carboxamides and sulfonamides having the formulae:

$$R^1R^2NCR_fSO_3^-H_2\overset{+}{N}R^1R^2, \text{ or}$$

$$R^1R^2NSO_2R_fCO_2^-H_2\overset{+}{N}R^1R^2$$

wherein R_f is perfluoroalkylene having 2 to 5 catenary carbon atoms or perfluorocycloalkylene having 4 to 7 ring atoms, R_f optionally being substituted by one or more straight chain, branched, or cyclic perfluoroalkyl groups of 1 to 12 carbon atoms, with R_f having a total of up to 14 carbon atoms, and each R^1 and R^2 is independently hydrogen, or a monovalent organic radical which can be the same as or different from any other R^1 or R^2, or each R^1 and R^2 bonded to the same N atom can combine with one another to form a cyclic structure containing the N atom, and R^1 and R^2 contain from 1 to about 20 carbon atoms, can be straight chain, branched or cyclic, can be saturated, unsaturated or aromatic, can contain skeletal or catenary hetero atoms other than carbon, and can be unsubstituted or substituted with non-interfering moieties.

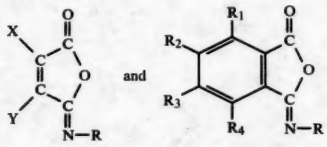
4,600,775

ISOMALEIMIDE AND ISOPHTHALAMIDE DERIVATIVES OF CHROMOPHORS

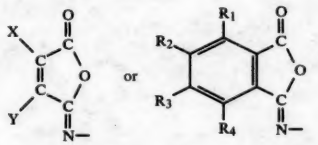
Spyros Theodoropulos, 2964 Hickory St., Yorktown Heights, N.Y. 10598

Filed Aug. 27, 1984, Ser. No. 644,564
Int. Cl.[4] C07D 265/28, 237/32, 311/82
U.S. Cl. 544—99 20 Claims

1. A compound selected from the group consisting of:

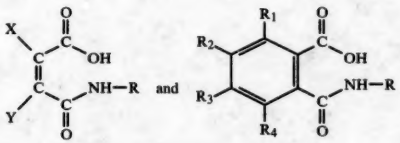


wherein R represents an organic chromophoric group exhibiting fluorescence, luminescense, chemoluminescence or absorption properties; R_1, R_2, R_3, and R_4 individually represent hydrogen or halogen, or alkyl, aryl, hydroxyl, carboxyl, alkyl or aryl-substituted or unsubstituted amino groups, nitro or sulfonic groups; and X and Y represent hydrogen or halogen, or alkyl, aryl, alkoxy, aryloxy, carboxyl, hydroxyl, alkyl or aryl-substituted or unsubstituted amino groups, nitro or sulfonic groups with the proviso that R does not contain a group of the formula:

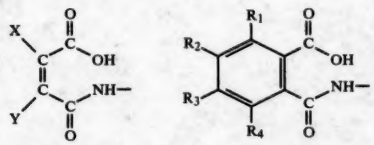


wherein R_1–R_4,X and Y are as indicated above.

13. A compound selected from the group consisting of:



wherein R represents an organic chromophoric group exhibiting fluorescence, luminescense, chemoluminescence or absorption properties; R_1, R_2, R_3, and R_4 individually represent hydrogen or halogen, or alkyl, aryl. hydroxyl, carboxyl, alkyl or aryl-substituted or unsubstituted amino groups, nitro or sulfonic groups; and X and Y represent hydrogen or halogen, or alkyl, aryl. alkoxy, aryloxy, carboxyl, hydroxyl, alkyl- or aryl-substituted or unsubstituted amino groups, nitro or sulfonic groups with the proviso that R does not contain a group of the formula:



wherein R_1–R_4, X and Y are as indicated above.

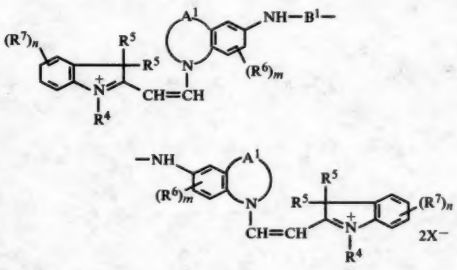
4,600,776

CATIONIC ENAMINE DYESTUFF INDOLYLMETHINE DERIVATIVES

Karlheinrich Meisel, and Roderich Raue, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 618,870
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1983, 3322318
Int. Cl.[4] C07D 209/12, 403/12; A61K 7/13; D06P 3/60
U.S. Cl. 544—198 5 Claims

1. A cationic enamine dyestuff compound of the formula



in which

R^4 represents an alkyl radical which has 1 to 4 C atoms and is optionally substituted by hydroxyl, alkoxy with 1 to 4 C atoms, acetoxy, halogen, cyano, carboxyl, C_1–C_4-carbalkoxy, carboxamido or acetyl,

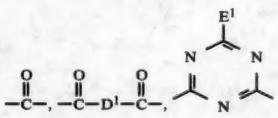
R^5 represents an alkyl radical with 1 to 4 C atoms, or the two radicals R^5 are closed to form a cyclopentyl or cyclohexyl ring,

R^6 represents an alkyl radical with 1 to 4 C atoms, an alkoxy radical with 1 to 4 C atoms or halogen,

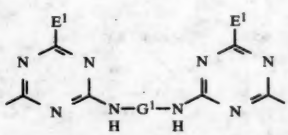
R^7 represents an alkyl radical with 1 to 4 C atoms, halogen, alkoxy with 1 to 4 C atoms, phenoxy, benzyloxy, benzyl, carboxyl, a carboxylic acid alkyl ester with 1 to 4 C atoms, a carboxamide or sulphonamide group which is optionally substituted by 1 or 2 C_1 to C_4-alkyl radicals, alkylsulphonyl with 1 to 4 C atoms, phenylsulphonyl, or a cyano, nitro, trifluoromethyl, acetyl or benzoyl group,

A^1 represents a $—(CH_2)_2—$ or $—(CH_2)_3—$ group which is optionally further substituted by alkyl groups with 1 to 4 C atoms,

B^1 corresponds to a radical of the formula



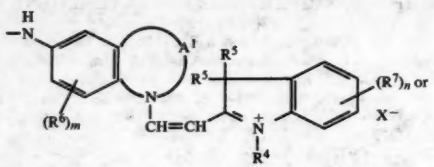
or



in which

D^1 represents an alkylene radical with 2 to 6 C atoms or a phenylene or naphthylene radical,

E^1 represents halogen, hydroxyl, alkoxy with 1 to 4 C atoms or a radical of the formula



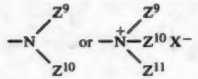
wherein

Z^6 and Z^7 independently of one another designate hydrogen or the radical $—Y^1—Z^8$,

wherein

Y^1 represents alkylene with 1 to 6 C atoms and

Z^8 designates hydrogen, hydroxyl, pyridinium or the radical

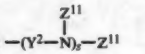


wherein

Z^9, Z^{10} and Z^{11} independently of one another denote hydrogen or alkyl which has 1 to 4 C atoms and is optionally substituted by hydroxyl,

and

Z^9 also represents phenyl, benzyl or the radical



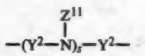
wherein

Y^2 represents alkylene with 2 to 4 C atoms and

s represents 1 to 8, or

Z^6 and Z^7, and Z^9 and Z^{10} are closed to form a pyrrolidine, morpholine, piperidine or piperazine ring, which can be substituted by C_1- to C_4-alkyl or amino-C_1- to C_4-alkyl,

G^1 represents an alkylene radical with 2 to 6 C atoms, a phenylene radical or a radical of the formula



m and n independently of one another represent 0, 1 or 2 and

X^- represents an anion.

4,600,777

METHOD OF PREPARING 1-ALKYL-7-OXODECAHYDROQUINOLINES, AND CIS(±) AND TRAN(±)ISOMERS SO PREPARED

Diane L. Huser; John M. Schaus; Robert D. Titus, and Leland O. Weigel, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

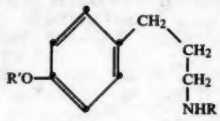
Filed Aug. 2, 1984, Ser. No. 637,181

Int. Cl.[4] C07D *215/20*

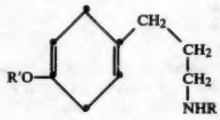
U.S. Cl. 546—164 **6 Claims**

1. The process which comprises

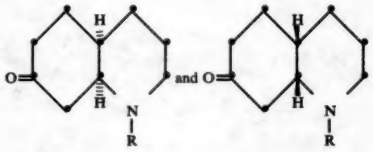
(a) reducing with lithium in liquid ammonia a compound of the formula



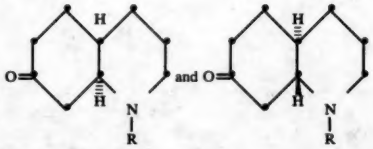
to yield a cyclohexadiene of the formula



(b) hydrolyzing the enol ether and cyclizing the resulting cyclohexen-1-one to yield a cis-(±)-1-C_{1-3} straight chain alkyl-7-oxodecahydroquinoline of the formulas

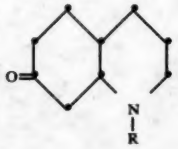


(c) and then isomerizing said cis-(±) product with base in a mutual, non-reacting polar solvent to yield a trans-(±)-1-C_{1-3} straight chain alkyl-7-oxodecahydroquinoline of the formula



wherein R and R' are independently C_{1-3} straight chain alkyl.

3. A cis± or trans± compound of the formula



wherein R is C_{1-3} straight chain alkyl.

4,600,778

PROCESS FOR THE PREPARATION OF 1,4-DIHYDROPYRIDINEDICARBOXYLIC ESTERS

Werner Teller; Wolfgang Koebernick; Arthur Haaf; Paul Naab, and Michael Preiss, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

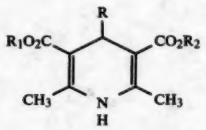
Filed Mar. 20, 1984, Ser. No. 591,614

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1983, 3312216; Apr. 5, 1983, 3312283

Int. Cl.[4] C07B *53/00;* C07D *211/90*

U.S. Cl. 546—249 11 Claims

1. In the preparation of a 1,4-dihydropyridine of the formula



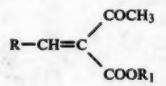
in which

R is a phenyl radical which is optionally substituted once or twice by nitro and/or chlorine,

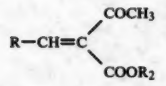
R_1 is a C_1–C_4-alkyl radical which is optionally substituted by a C_1–C_4-alkoxy group, and

R_2 is a C_1–C_{12}-alkyl radical which is optionally substituted by a C_1–C_4-alkoxy group, a trifluoromethyl group or the radical $(C_6H_5CH_2)(CH_3)N$,

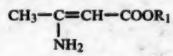
by preparing an ylidene compound of the formula



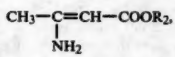
or



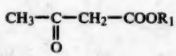
and reacting such ylidene compound with an enamine compound of the formula



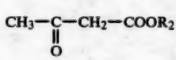
or



the improvement which comprises preparing the ylidene compound by reaction of a ketocarboxylic ester of the formula



or



with an aldehyde of the formula RCHO, in an aliphatic alcohol as solvent in the presence of a catalytic amount of piperidine acetate, at a temperature from about −10° C. up to 100° C.

4,600,779

SUBSTITUTED 3,4-DIAMINO-1,2,5-THIADIAZOLES HAVING HISTAMINE H_2-RECEPTOR ANTAGONIST ACTIVITY

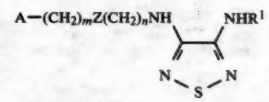
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 473,791, Mar. 16, 1983, Pat. No. 4,528,377, which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,649

Int. Cl.[4] C07D *285/10, 417/10, 417/12, 417/14*

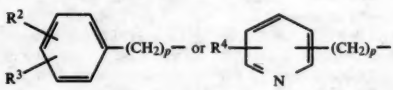
U.S. Cl. 548—135 4 Claims

1. A compound of the formula



I

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



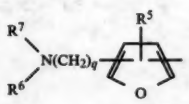
in which p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower-)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independelty (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; or a nontoxic pharmaceutically acceptable salt, hydrate or solvate thereof.

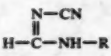
4,600,780

N-CYANO-FORMAMIDINES

Rafael Foguet; Luis Anglada; Manuel M. Raga; José A. Ortiz; Aurelio Sacristán, and José M. Castelló, all of Barcelona, Spain, assignors to Ferrer International, S.A., Barcelona, Spain

Filed Mar. 20, 1984, Ser. No. 595,662
Claims priority, application Spain, Mar. 30, 1983, 521588
Int. Cl.[4] C07D 277/20, 211/18
U.S. Cl. 548—193 5 Claims

1. A compound of the Formula (I)



wherein R is 2[[(5-methyl-1H-imidazol-4yl)methyl]thio]ethyl, 2-[[[5-[(dimethylamino)methyl]-2-furanyl]methyl]thio]ethyl, or 2-[[[2-[(aminoiminomethyl)amino]-4-thiazolyl]methyl]thio]ethyl, or a nontoxic acid addition salt thereof.

4,600,781

2-FORMYL-2-HALOMALONATES AND COMPOUND DERIVED THEREFROM

Ivan A. Wolff, Oreland, Pa., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jul. 2, 1984, Ser. No. 626,960
Int. Cl.[4] C07D 277/14; C07C 69/67, 67/307
U.S. Cl. 548—201 5 Claims

1. Diethyl 2-formyl-2 bromomalonate.

5. A method of preparing l-2-(dicarbethoxymethylene)-thiazolidine-4-carboxylic acid comprising reacting diethyl 2-formyl-2-bromomalonate with l-cysteine hydrochloride monohydrate, adding pyridine to precipitate out l-cystine treating the filtrate from the precipitation with saturated sodium bicarbonate, extracting the treated filtrate with chloroform and acidifying to obtain the thiazolidine.

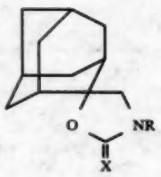
4,600,782

SUBSTITUTED SPIRO[OXAZOLIDINE-5,2'-ADAMANTANE] COMPOUNDS

Vassil S. Georgiev, Rochester, and Clyde R. Kinsolving, Fairport, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 15, 1984, Ser. No. 620,785
Int. Cl.[4] C07D 263/52; A61K 31/42
U.S. Cl. 548—216 10 Claims

1. A spiro[oxazolidine-5,2'-adamantane] compound having the formula:



where R is selected from H, benzoyl, nitrobenzoyl and spiro [2-oxazolidinone-5,2'-adamantane]-3-thiocarbonyl; and where X is selected from oxygen, cyclododecane, tricyclo[5.2.1.$0^{2,6}$]-decane and norbornane.

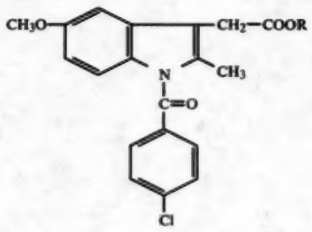
4,600,783

PROCESS FOR PREPARING ACEMETACIN

Samir Samaan, and Harald Horstmann, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 25, 1985, Ser. No. 726,880
Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416895
Int. Cl.[4] C07D 209/28
U.S. Cl. 548—501 7 Claims

1. A process for preparing acemetacin, comprising in a first step reacting indometacin of the formula



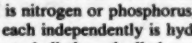
in which

R is an alkali metal or alkaline earth metal or the group MY_4,

M is nitrogen or phosphorus, and

Y each independently is hydrogen, or an optionally substituted alkyl, cycloalkyl or aryl,

with a tert.-butyl halogenoacetate of the formula



in which

Hal is chlorine, bromine or iodine, within the temperature range from −30° C. to +70° C. in the presence of at least one inert organic solvent and a phase transfer catalyst, and subsequently in a second step completing reaction within the temperature range from −30° C. to +120° C. in the presence of sulphuric acid and/or sulphonic acid.

4,600,784

HIGH PRESSURE SYNTHESIS OF SUBSTITUTED TETRATHIAFULVALENES

Yoshiyuki Okamoto, Ft. Lee, and Joseph E. Rice, Waldwick, both of N.J., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 415,331, Sep. 7, 1982, abandoned, which is a division of Ser. No. 286,142, Jul. 9, 1982, abandoned. This application Dec. 27, 1985, Ser. No. 814,104
Int. Cl.[4] C07D 339/06
U.S. Cl. 549—39 10 Claims

1. A process for preparing a fulvalene compound, said process comprising the step of subjecting a mixture of reactants in the absence of a catalyst to a pressure of at least about 1,000 atmospheres, for a time and at a temperature between about 70° C. and 110° C. to form said fulvalene compound, said reactants comprising carbon disulfide and at least one compound containing an acetylenic moiety of the general formula

wherein each of the Z substituents may be the same or different and is a member selected from the set consisting of the following groups -H and

wherein R is selected from OCH_3, OC_2H_5, OH and NH_2; with the proviso that at least one of the Z substituents is an electron withdrawing group.

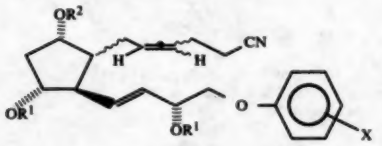
4,600,785

PROCESSES AND INTERMEDIATES FOR MAKING 16-PHENOXY AND 16-SUBSTITUTED PHENOXY-PROSTATRIENOIC ACID DERIVATIVES

Gary F. Cooper, Menlo Park; Douglas L. Wren, Palo Alto; Albert R. Van Horn, San Jose; Tsung-Tee Li, Los Altos Hills, and Colin C. Beard, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Dec. 22, 1983, Ser. No. 564,386
Int. Cl.[4] C07C *177/00*
U.S. Cl. 549—212 **4 Claims**

1. An enantiomer of a compound of the formula



IV

or a racemic mixture thereof wherein R^1 is a base-stabile acid-labile ether-forming group; R^2 is a base-labile ether-forming group; X is hydrogen, halo, trifluoromethyl, lower alkyl or lower alkoxy, and the wavy lines represent the α or β configuration with the proviso that when one wavy line is α the other is β.

4,600,786

ANTIBIOTIC OBAFLUROIN

Richard B. Sykes, Belle Mead, and Adrienne Tymiak, Hopewell, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 23, 1983, Ser. No. 554,507
Int. Cl.[4] C07D *305/12*
U.S. Cl. 549—263 **1 Claim**

1. 2,3-Dihydroxy-N-[2-[(4-nitrophenyl)methyl]-4-oxo-3-oxetanyl]benzamide.

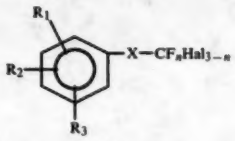
4,600,787

PROCESS FOR THE PREPARATION OF AROMATIC COMPOUNDS WHICH CONTAIN PERFLUORINATED SIDE-CHAINS BONDED VIA A HETEROATOM

Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 23, 1984, Ser. No. 602,849
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315147
Int. Cl.[4] C07D *319/14*; C07C *51/00, 43/20*
U.S. Cl. 549—362 **16 Claims**

1. A process for the preparation of an aromatic compound which contains a perfluorinated side-chain bound to the aromatic nucleus via a heteroatom which comprises contacting an aromatic compound containing a perhalogenated side-chain which is only partially fluorinated and which is bound to the aromatic nucleus via a heteroatom with a catalyst, said compound which is perhalogenated, but only partially fluorinated having the formula



(I)

in which independently of one another,

R_1 represents hydrogen, C_1–C_2-alkyl, C_6–C_8-aryl, COF, COCl, NO_2, SO_2Cl, CN, 0-C_1–C_4-alkyl, 0-C_6–C_8-aryl, F, Cl or Br,

R_2 represents hydrogen, NO_2, SO_2Cl, F, Cl or Br,

R_3 represents hydrogen, COF, COCl, F, Cl or Br, or

R_1 and R_3 together represent a carbocyclic ring having 3 or 4 C atoms,

X represents O or S,

n represents 1 or 2 and

Hal represents Cl and/or Br,

said catalyst being selected from the group consisting of aluminum trichloride, aluminum tribromide, boron trichloride, arsenic pentachloride, antimony pentachloride, molybdenum pentachloride, titanium tetrachloride, iron trichloride and mixtures thereof, said catalyst being present in an amount of 0.001 to 0.1 mol per mol of aromatic compound, which is perhalogenated, but only partially fluorinated, wherein such process involves halogen interchange transfer in one or more fluoro-halo substituents bound to the aromatic nucleus via a hetero atom.

16. A process according to claim **1**, wherein the aromatic compound is selected from the group consisting of
2-fluoro-2-chloro-benzodioxole,
3-difluorochloromethoxy-benzoyl fluoride,
2-difluoromethoxy-trichloromethoxybenzene,
6-nitro-2-chloro-2,3,3-trifluoro-benzo-1,4-dioxene,
4-difluorochloromethoxy-nitrobenzene,
3-difluorochloromethoxy-nitrobenzene,
4-difluorochloromethoxy-3-methyl-nitrobenzene,
4-difluorochloromethoxy-chloroformylbenzene,
3-difluorochloromethoxy-2,4-dichlorotoluene,
3-difluoro-chloromethoxy-4,6-dichlorotoluene,
3-difluorochloromethoxy-2,4,6-trichlorotoluene and
2,chloro-2,3,3-trifluoro-benzo-1,4-dioxene.

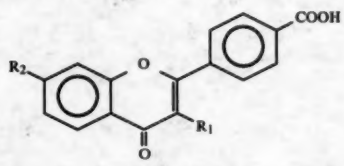
4,600,788

4'-FLAVONECARBOXYLIC ACIDS AND PHARMACEUTICALLY ACCEPTABLE DERIVATIVES THEIR PREPARATION, AND THEIR APPLICATION

Marie-Hélène Creuzet, Bordeaux; Claude Feniou, Pessac; Francoise Guichard, Bordeaux; Gisèle Prat, Talence; Jacqueline Mosser, Saint-Medard-en-Jalles, and Henri Pontagnier, Pessac, all of France, assignors to Societe Cortial, S.A., Paris, France

Filed Mar. 22, 1984, Ser. No. 592,272
Claims priority, application France, Mar. 24, 1983, 83 05013
Int. Cl.[4] C07D *311/04*
U.S. Cl. 549—403 **6 Claims**

1. A compound of the formula



wherein R_1 is H, OH, $OCOCH_3$, OCO_2CH_3, branched or unbranched alkyl containing 1 to 5 carbon atoms,

R_2 is $NHCOR_3$, $NHCOCH_2X$, $NHSO_2CH_3$, $N(SO_2CH_3)_2$, $SO_2N(CH_3)_2$, SO_2NHCH_3, $SO_2NCH_3CH_2CH_2OH$, SO_2NH_2, wherein R_3 is a lower alkyl containing 1 to 4 carbon atoms, and X is NR_4R_5 or

wherein R_4 and R_5 are both independently lower alkyls containing 1 to 4 carbon atoms and

is piperidine, pyrrolidine or morpholine, and pharmaceutically acceptable derivatives thereof such as esters, amides or salts.

4. A pharmaceutical composition suitable for human or veterinary use in the treatment of diabetes comprising the compound of claim 1 and a pharmaceutically acceptable carrier, wherein said compound is present in an anti-diabetic effective amount or an anti-diuretic effective amount.

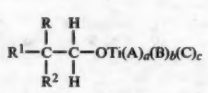
4,600,789

NEOALKOXY ORGANO-TITANATE USEFUL AS COUPLING AND POLYMER PROCESSING AGENTS

Gerald Sugerman, Allendale, N.J., and Salvatore J. Monte, Staten Island, N.Y., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Filed May 14, 1984, Ser. No. 609,727
Int. Cl.[4] C07F 7/28; C11C 1/00
U.S. Cl. 556—17 13 Claims

1. A organo-titanate having the formula:



wherein R, R^1 and R^2 are each a monovalent alkyl, alkenyl, alkynyl, aralkyl, aryl or alkaryl group having up to 20 carbon atoms or a halogen or ether substituted derivative thereof, and, in addition, R^2 may also be an oxy derivative or an ether substituted oxy derivative of said groups; A, B and C are each a monovalent aroxy, thioaroxy, diester phosphate, diester pyrophosphate, oxyalkylamino, sulfonyl or carboxyl; and $a+b+c=3$.

4,600,790

SILICON COMPOUNDS CONTAINING SIC-BONDED BIURET GROUPS AND A METHOD FOR PREPARING THE SAME

Herbert Eck; Hartmut Menzel, both of Munich; Reinhard Jira, and Alfred Prasse, both of Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,238
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410582
Int. Cl.[4] C07F 7/08, 7/10
U.S. Cl. 556—421 14 Claims

1. Silicon compounds containing SiC-bonded biuret groups and SiOC-bonded aliphatic radicals which are obtained by

(I) the addition of a silane containing up to 2 silicon atoms per molecule and an SiC-bonded organic radical which has at least one basic

group and at least one SiOC-bonded aliphatic radical per molecule to an isocyanate selected from the group consisting of a monoisocyanate, a diisocyanate and mixtures thereof in an amount of at least 1 gram-equivalent of —NCO group per gram-equivalent of

group present in the silane at a temperature up to 125° C.; and thereafter

(II) the product obtained in (I) is maintained for at least 2 minutes at a temperature of from 110° C. to 125° C.

4,600,791

PROCESS FOR PREPARATION OF PHOSPHAZENE ESTERS

Lawrence J. Carr, Elk Grove Village, and George M. Nichols, Evanston, both of Ill., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Dec. 12, 1983, Ser. No. 560,096
Int. Cl.[4] C07F 9/24
U.S. Cl. 558—80 11 Claims

1. A process for the preparation of phosphazene esters comprising reacting a dichlorophosphazene with a hydroxyl reactant which is a phenol, a polyfluoroalkanol, or mixtures thereof, in a medium comprising a mixture of water, a base, a water-immiscible solvent and a phase-transfer catalyst.

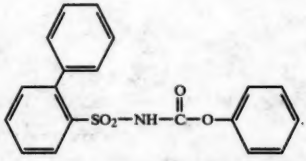
4,600,792

PREPARATION OF BIPHENYLYLSULFONYLUREAS AND INTERMEDIATES THEREFOR

Kozo Shiokawa, Kanagawa; Shinzo Kagabu, and Koichi Moriya, both of Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Apr. 8, 1985, Ser. No. 720,826
Claims priority, application Japan, Apr. 11, 1984, 59-70909
Int. Cl.[4] C07C 143/83
U.S. Cl. 560—12 1 Claim

1. Phenyl 2-biphenylylsulfonylcarbamate of the formula



4,600,793

PROCESS FOR THE PREPARATION OF URETHANES

John H. Grate, Palo Alto; David R. Hamm, Mountain View, and Donald H. Valentine, Santa Clara, all of Calif., assignors to Catalytica Associates, Mountain View, Calif. and Haldor Topsoe A/S, Copenhagen, Denmark

Filed Sep. 16, 1983, Ser. No. 532,784
Int. Cl.[4] C07C 125/065, 125/073, 125/077
U.S. Cl. 560—25 18 Claims

1. A process for converting a nitrogen-containing organic compound, selected from the group consisting of nitro, nitroso, azo, and azoxy compounds, into the corresponding urethane, by reacting a solution comprising said nitrogen-containing

organic compound and a hydroxyl-containing organic compound with carbon monoxide, which comprises the steps of:

(a) providing a primary amine in said solution, and

(b) contacting the solution of step (a) with carbon monoxide, in the presence of a catalyst comprising a halide-free ruthenium compound, at conditions sufficient to convert said nitrogen-containing organic compound into the said corresponding urethane.

4,600,794

PROCESS FOR PREPARING GAMMA-DIMETHYLAMINO L-BETA HYDROXY BUTYRIC ACID

Maria O. Tinti, Rome, Italy, assignor to Sigma Tau Industrie Farmaceutiche Riunite S.P.A., Rome, Italy

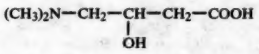
Filed Jun. 28, 1985, Ser. No. 750,690

Claims priority, application Italy, Jul. 27, 1984, 48659 A/84

Int. Cl.[4] C07C *101/30*

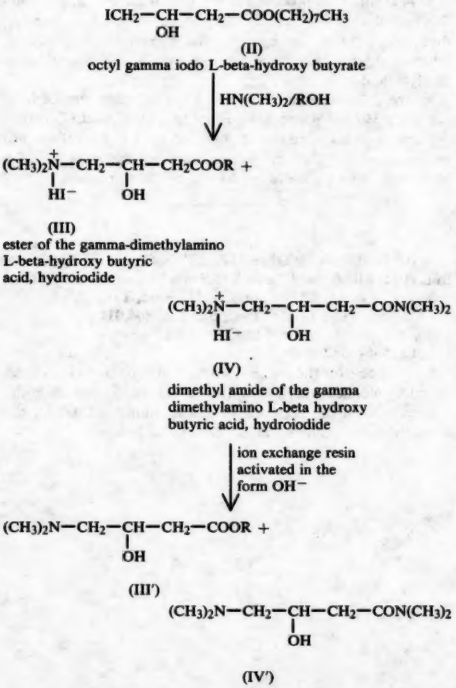
U.S. Cl. 562—567 **1 Claim**

1. Process for preparing L-norcarnitine

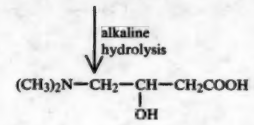


(I)

according to the following reaction scheme:



-continued



(I)

gamma dimethylamino L-beta-hydroxy butyric acid (L-norcarnitine)

comprising the steps of:

(a) reacting a solution of octyl gamma iodo L-beta hydroxy butyrate (II) in a lower alkanol ROH wherein R is lower alkyl with a solution of dimethylamine in the same lower alkanol with molar ratio from 1:2 to 1:4, keeping the reaction mixture under stirring at 25°–35° C. for 15–24 hours, thereby obtaining a mixture of the hydroiodides of the ester (III) and dimethylamide (IV) of the gamma-dimethylamino-L-beta-hydroxy-butyric acid;

(b) concentrating under vacuum the mixture of step (a), taking up with water the residue and purifying the mixture thus obtained by extraction with a water-immiscible organic solvent, eluting on a weakly basic ion exchange resin activated in the OH^- form in order to remove the iodide ion, thereby obtaining a mixture of ester (III') and dimethylamide (IV') of the gamma-dimethylamino L-beta-hydroxy-butyric acid which are not isolated;

(c) hydrolyzing the mixture of the ester (III') and amide (IV') in alkaline aqueous environment at pH 11–13 at 40°–60° C. in about 4 to 8 hours, thereby obtaining L-norcarnitine (I); and

(d) purifying the L-norcarnitine thus obtained by removal of the cations via elution on a weakly acid ion exchange resin activated in the H^+ form.

4,600,795

PREPARATION AND RECOVERY OF METHACRYLIC ACID AND ITS ESTERS

Peter J. Frank, Westerville, and Jerry R. Hite, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 19, 1982, Ser. No. 369,383

Int. Cl.[4] C07C *51/377, 51/50, 57/075, 67/317, 67/62, 69/54*

U.S. Cl. 562—599 **4 Claims**

1. In a process for the vapor phase catalytic oxydehydrogenation of isobutyric acid or its esters to form methacrylic acid or its esters wherein the gaseous product is condensed and purified, the improvement consisting of adding to the gaseous product at or about the point of its condensation from 1 to 6000 ppm of a surfactant material selected from the group consisting of an anionic a cationic and a non-ionic surfactant.

4,600,796

REACTION PRODUCTS OF ALKANOL AMINES WITH BICYCLIC AMIDE ACETALS AND THEIR APPLICATION IN POLYURETHANE POLYMERS

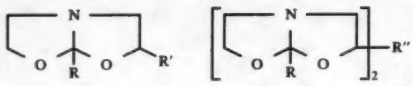
Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Russell, Ky.

Filed Jun. 3, 1985, Ser. No. 740,663

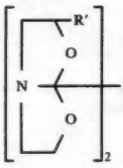
Int. Cl.[4] C07C *102/00, 103/82, 103/44*

U.S. Cl. 564—159 **5 Claims**

1. The process for preparing an amide-amine-ether containing polyol comprising reacting at a temperature of at least about 120° C. A mixture of a bicyclic amide acetal and an alkanol amine wherein the bicyclic amide acetal is one conforming to at least one of the Formulas I, II or III



I II



III

wherein R represents hydrogen, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an alkaryl group having from 7 to 20 carbon atoms, R′ represents hydrogen, an alkyl group having from 1 to 10 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 15 carbon atoms or an ether group having from 1 to 20 carbon atoms, and R″ represents an alkylene group having from 1 to 20 carbon atoms or an alkylene ether group having from 1 to 20 carbon atoms and wherein the alkanol amine is at least one having Formula IV or V

IV V

wherein R′ has the foregoing designation and A and B independently represent an alkylene group having at least 4 carbon atoms or an alkylene ether group containing 3 or more carbon atoms, and n is a number of from 1 to 3.

4,600,797

PROCESS FOR THE PREPARATION OF NITROAMINOBENZENES

Willi Schössler, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 359,331, Mar. 18, 1982, abandoned, which is a continuation of Ser. No. 199,888, Oct. 23, 1980, abandoned, and a continuation-in-part of Ser. No. 199,889, Oct. 23, 1980, abandoned, and Ser. No. 199,876, Oct. 23, 1986, abandoned. This application Feb. 18, 1983, Ser. No. 468,030

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942676; Sep. 9, 1980, 3033862; Oct. 10, 1980, 3038394

Int. Cl.⁴ C07C *85/02*

U.S. Cl. 564—414 **47 Claims**

1. In a process for the preparation of a nitroaminobenzene by nitrating with nitric acid an aminobenzene which is protected at the nitrogen by a protective group, the improvement which comprises simultaneously introducing 30% to 99% by weight of the total amount of the nitric acid and said aminobenzene to be nitrated into a reaction vessel containing 1% to 70% by weight of the total amount of the nitric acid, and one or more inert solvents and/or diluents, and splitting off the protective group of the nitroaminobenzene after the nitroaminobenzene is prepared.

4,600,798

ARYL-DIETHERS

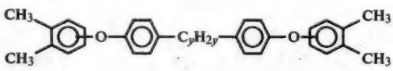
James A. Cella, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 18, 1985, Ser. No. 712,487

Int. Cl.⁴ C07C *43/275*

U.S. Cl. 568—636 **4 Claims**

1. An aryl-diether of the formula



wherein y is a whole number from 1 to 5.

4,600,799

PREPARATION OF TRIMETHYLHYDROQUINONE

Franz J. Bröecker, Ludwigshafen; Peter Tavs, Limburgerhof; Harald Laas, Maxdorf, and Wolf-Karlo Aders, Ellerstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,194

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404337

Int. Cl.⁴ C07C *37/07*

U.S. Cl. 568—772 **8 Claims**

1. A continuous process for the preparation of 2,3,6-trimethylhydroquinone by catalytic hydrogenation of 2,3,6-trimethylquinone with hydrogen in the presence of a solvent, wherein the reaction is carried out over a platinum/alumina catalyst, and

wherein the alumina carrier has a BET surface area of from 1 to 350 m^2/g and a pore volume of from 0.35 to 0.60 cm^3/g in the pore radius range from 1.8 to 60,000 nm, not less than 60% of this pore volume being constituted by pores having a radius of from 2 to 200 nm.

4,600,800

DOWNFLOW ISOMERIZATION OF EPOXIDES

Robert H. Ellison, and Peter S. Friend, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 3, 1985, Ser. No. 804,011

Int. Cl.⁴ C07C *35/08*

U.S. Cl. 568—832 **17 Claims**

1. A process for the isomerization of an epoxide to the corresponding alcohol which comprises isomerizing epoxide in the liquid phase in the presence of a solid alumina catalyst, the isomerization conducted in the downflow mode.

4,600,801

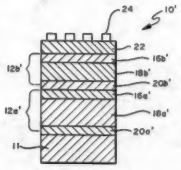
FLUORINATED, P-DOPED MICROCRYSTALLINE SILICON SEMICONDUCTOR ALLOY MATERIAL

Subhendu Guha, Clawson, and James Kulman, Detroit, both of Mich., assignors to Sovonics Solar Systems, Troy, Mich.

Filed Nov. 2, 1984, Ser. No. 667,659

Int. Cl.[4] H01L *31/06, 31/18*

U.S. Cl. 136—249 **46 Claims**



32. In a photovoltaic device of the type which includes at least two superposed cells, each cell including a p-doped semiconductor alloy layer therein, the improvement comprising:

the p-doped layer of at least one of said at least two cells formed of a fluorinated p-doped microcrystalline silicon alloy material having an optical gap wider than the band gap of the corresponding amorphous silicon alloy material.

4,600,802

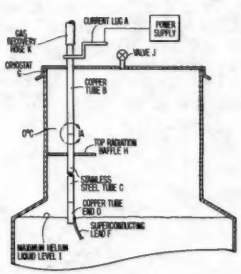
CRYOGENIC CURRENT LEAD AND METHOD

Gary G. Ihas, Gainesville, Fla., and Robert F. Berg, Columbia, Md., assignors to University of Florida, Gainesville, Fla.

Filed Jul. 17, 1984, Ser. No. 631,790

Int. Cl.[4] F17C *3/00;* **H01B** *7/34*

U.S. Cl. 174—15 CA **24 Claims**



11. A current lead for carrying electrical current between room temperature and a cryogenic region containing liquid helium coolant, wherein said lead is cooled by the passage of cold vapor from said coolant through said lead and including:

(a) an elongated, tubular first member adapted to extend from room temperature into the upper portion of said cryogenic region and having an upper end, a lower end, and an inside;

(b) an elongated, tubular second member having an inside, a lower end, and an upper end which is joined to the lower end of said first member, said second member extending below said first member;

(c) an elongated, tubular third member having an inside, a lower end, and an upper end which is joined to the lower end of said second member, said third member extending below said second member;

(d) a plurality of wires having upper ends and lower ends and contained at least partially within said second member, said upper ends of said plurality of wires attached to the inside of said first member and said lower ends of said plurality of wires attached to the inside of said third member.

15. The combination of a current lead for carrying current between room temperature and a cryogenic region and cooled by passage of cold gas from the cryogenic region through said current lead including:

(a) an elongate relatively high thermal and electrically conductive hollow first member having an upper end and a lower end and allowing passage of the cold gas therethrough;

(b) an elongate relatively low thermal and electrically conductive hollow second member fixed to said lower end of said first member and extending below said first member, said second member having an upper end and a lower end and allowing passage of the cold gas therethrough; and

(c) relatively high thermal and electrically conductive wire including a plurality of strands and having a top end attached to the inside of said first member, said wire extending down through the inside of said second member for cooling by passage of the cold gas and adaptable to carry current to at least one superconducting lead electrically connected to said wire adjacent said bottom of said wire; and a cryostat having downwardly decreasing temperatures and a liquid coolant bath, and wherein said lower end of said first member is disposed at below 10° C. and wherein said first member extends from outside of said cryostat to inside of said cryostat.

21. A method of using in combination a cryostat having downwardly decreasing temperatures and a liquid coolant bath and a current lead, said current lead including:

(a) an elongate relatively high thermal and electrically conductive hollow first member having an upper end and a lower end and allowing passage of the cold gas therethrough;

(b) an elongate relatively low thermal and electrically conductive hollow second member fixed to said lower end of said first member and extending below said first member, said second member having an upper end and a lower end and allowing passage of the cold gas therethrough; and

(c) relatively high thermal and electrically conductive wire including a plurality of strands and having a top end attached to the inside of said first member, said wire extending down through the inside of said second member for cooling by passage of the cold gas and adaptable to carry current to at least one superconducting lead electrically connected to said wire adjacent said bottom of said wire; and

wherein said first member is adapted to extend from outside of a cryogenic chamber to inside of a cryogenic chamber; comprising the steps of:

inserting said current lead into a cryostat with downwardly decreasing temperatures and with said superconducting lead extending into a liquid coolant bath in said cryostat, said lower end of said first member disposed below 10° C. in the cryostat; and electrically connecting a power source to said first member to supply power to within said cryostat by way of said current lead.

4,600,803

CABLE SCREW JOINT

Hermann Holzmann, Salzäckerstr. 59, 7000 Stuttgart-80, Fed. Rep. of Germany

Filed Dec. 4, 1984, Ser. No. 677,990

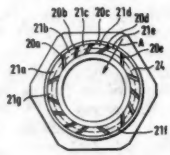
Claims priority, application Fed. Rep. of Germany, May 22, 1984, 3418978

Int. Cl.[4] H02G *3/06*

U.S. Cl. 174—65 SS **5 Claims**

1. A plastic screw joint including a hollow cylindrical intermediate connection piece having a box nut, said intermediate connection piece being provided with circularly arranged clamping tongues forming an annular clamping tongue arrangement, said clamping tongues urging the sealing body

inwardly against a workpiece as the box nut is screwed on, wherein the clamping tongues are segmented and arranged adjacent to each other and when the clamping tongues are positioned closely adjacent each other, they are separated by slots, inclined obliquely relative to the respective diameter, and a predetermined number of such slots is followed by a slot inclined by the same angle but in opposite direction so that a



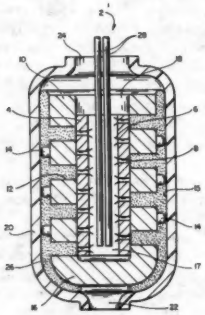
wedge-like shape is obtained for every selective clamping tongue being disposed between two such oppositely directed slots due to which shape it is urged inwardly and out of the remaining annular clamping tongue arrangement when the box nut starts to exert pressure, whereby a non-circular relation between the cable and the annular clamping tongue arrangement is obtained.

4,600,804

CRIMP CONNECTOR HAVING GEL BETWEEN ENVELOPE AND CRIMP BODY

Peter Howard, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 6, 1985, Ser. No. 698,648
Int. Cl.[4] H02G *15/08*
U.S. Cl. 174—84 C **15 Claims**



1. An electrical crimp connector, comprising:
means for piercing electrical conductors;
a crimping body surrounding the piercing means;
an insulating envelope disposed around the crimping body;
means for forming a space between an outer surface of the crimping body and an inner surface of the insulating envelope; and
a gel disposed within the space.

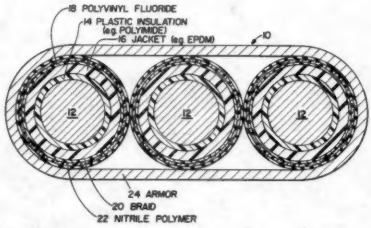
4,600,805

FLAT SUBMERSIBLE ELECTRICAL CABLE

John R. Glynn, Lawrence, Kans., and Lloyd A. Cobb, Akron, Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Aug. 6, 1984, Ser. No. 638,150
Int. Cl.[4] H01B *7/18*
U.S. Cl. 174—102 R **12 Claims**

1. A multi-conductor electrical cable for use in a high temperature and high pressure corrosive environment, said cable comprising:
a plurality of electrical conductors; an inner jacket layer of a polymeric material which is mechanically and chemically stable at elevated temperatures closely jacketing each said conductor; a protective braid closely surrounding each of said inner jacket layers, said braids being constructed of a material having mechanical integrity at elevated tempratures; and an outer jacket of nitrile polymer highly permeable to any entrapped gases, and having a permeability constant in the range of from about 20 cc/100 in.^{2}/24 hrs./atm. to about 50 cc/100 in^2/24 hrs./atm.

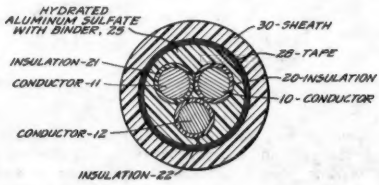


4,600,806

ELECTRIC CABLE WITH COVERING PREVENTING FIRE SPREADING

Germano Beretta, Monza, Italy, assignor to Societa' Cavi Pirelli, S.p.A., Milan, Italy

Filed Apr. 15, 1985, Ser. No. 723,090
Claims priority, application Italy, Apr. 18, 1984, 20583 A/84
Int. Cl.[4] H01B *7/02*
U.S. Cl. 174—121 A **6 Claims**

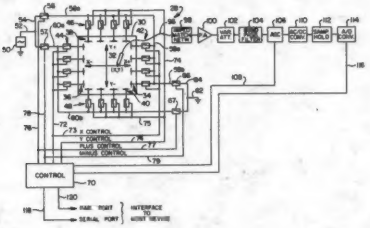


1. In an electric cable comprising at least one insulated conductor having a first layer of insulating material around said at least one conductor, and a sheath in the form of a second layer of insulating material around said at least one insulated conductor and a third layer of insulating material around said at least one conductor, the insulating material of said first layer, said second layer and said third layer, when burned, producing only low amounts of acid-derived gases and smoke, wherein the improvement comprises at least one of said second layer and said third layer being formed from a mixture of a plastic binder which is substantially free of halogens, sulfur and nitrogen with hydrated aluminum sulfate, said hydrated aluminum sulfate being present in an amount from about 30% to about 80% by weight of the weight of said one of said second layer and said third layer for resisting the spreading of fire.

4,600,807
ELECTROGRAPHIC APPARATUS

Robert G. Kable, Dublin, Ohio, assignor to Scriptel Corporation, Columbus, Ohio

Filed Oct. 26, 1984, Ser. No. 665,302
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **51 Claims**



33. Electrographic apparatus comprising:

means defining a resistive surface of given active area having oppositely disposed border regions;

a time varying excitation source of select frequency;

a ground reference;

switching means controllable for applying said ground reference to one said border region and simultaneously applying said source to the oppositely disposed said border region during a first operational mode, and for reversing said applications of ground reference and source to said border regions during a second operational mode;

locator means movable in adjacency about said resistive surface for effecting capacitive coupling therewith during said first and second modes to provide position signals, said locator means having a given response characteristic;

signal treatment means including an input stage responsive to said position signals for effecting the amplification thereof to provide amplified position signals;

filter means for filtering said amplified position signals in correspondence with said select frequency to provide filtered position signals;

converter means responsive to said filtered position signals to provide d.c. level position signals corresponding therewith;

digital converter means responsive, when actuated, to convert said d.c. level position signals to digital position signals;

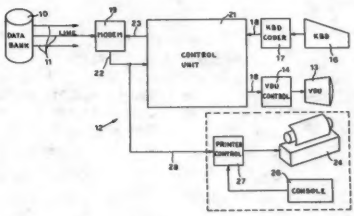
control means for controlling said switching means to provide said first and second operational modes, said control means having memory means for retaining border data minimum values representing said digital position signals corresponding with the terminus of said active area of said resistive surface at each said border region thereof, said control means effecting the determination of normalized digital position values with respect to said first and second operational modes as a difference/sum ratio and being responsive to subtract the corresponding minimum border data value from said normalized digital position value to derive a difference value which is expanded to, in turn, derive digital data signals.

4,600,808
PRINT APPARATUS FOR VIDEOTEX TERMINAL

Giuseppe Cosentino, Lessolo, and Franco Provera, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed May 8, 1984, Ser. No. 608,200
Claims priority, application Italy, May 13, 1983, 67538 A/83
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 DP **13 Claims**

1. An apparatus for a videotex communicating terminal comprising a modem for demodulating signals received from a line and representing coded data, a video display for displaying alphanumeric and semigraphic characters corresponding to said coded data, a dot printer for printing alphanumeric and semigraphic characters corresponding to said coded data on a print carrier, video control means connected between said modem and said video display for decoding the coded data received by said modem and controlling said video display to display the decoded characters, and a printer control unit connected between said modem and said printer for decoding the coded data received by said modem independently of said

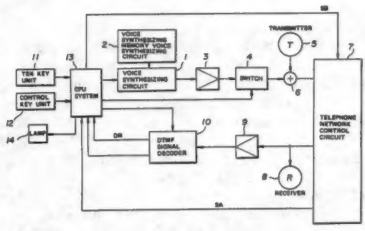


video control means and for controlling said printer to print the characters decoded by said printer control unit, said printer control unit including transcoding means for transcoding the coded data received by said modem and supplying the transcoded data to said printer, memory means for temporarily storing the data so transcoded, means for providing a selectively operable print command, and a character generator operable in response to said print command to decode the data stored in said memory means to control said printer.

4,600,809
TELEPHONE SYSTEMS

Kaoru Tatsumi, Hino; Takao Kishida, Hachioji; Kuniyoshi Marui, Tokorozawa, and Takaaki Ishii, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1984, Ser. No. 613,646
Claims priority, application Japan, Nov. 30, 1983, 58-226455
Int. Cl.[4] H04M *11/10*
U.S. Cl. 179—2 EA **16 Claims**



1. A telephone system comprising:

first memory means for storing unit audio data for synthesizing voice messages;

a DTMF signal decoder for receiving and decoding a DTMF signal generated in response to operation of signal keys by a calling party over a signal path;

means for controlling said DTMF signal decoder to decode a first number sequence transmitted via said signal keys by said calling party;

second memory means for storing said decoded number sequence;

voice synthesizing means for accessing said unit audio data stored in said first memory means and for transmitting to

said calling party over said signal path a confirmatory audio message composed of selected unit audio data, said message including a repetition of said first number sequence stored in said second memory means and a request to enter a reply thereto; and

means responsive to said DTMF signal decoder for interrupting said signal path to said calling party upon receiving a first reply from said calling party, and, in response to a second reply from said calling party, for conditioning said DTMF decoder to receive and decode a second number sequence transmitted by said calling party.

4,600,810

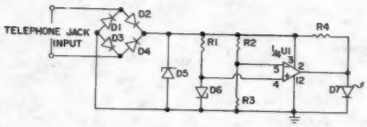
TELEPHONE LINE TESTER

Steven Feldman, Seminole, and David J. Kimmel, Clearwater, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 7, 1984, Ser. No. 648,409

Int. Cl.[4] H04B *3/46*

U.S. Cl. 179—175.3 R **17 Claims**



1. A hand-held testing device for testing telephone tip and ring signal voltages comprising:

a body portion,

a test circuit attached to the body portion, the test circuit comprising voltage rectifer means for compensating polarity mismatches of the tip and ring signals as an input voltage,

reference voltage means for establishing and holding constant a predetermined voltage,

voltage divider means,

voltage comparator means for comparing the reference voltage and the voltage across the voltage divider, and

sensory means for indicating conditions where the tip and ring signal voltage exceeds the reference voltage, whereby

the circuit may be connected to the telephone tip and ring signal thereby isolating faulty electronics in a telephone set or local premises wiring.

4,600,811

SUBSCRIBER LINE INTERFACE CIRCUIT

Takao Hayashi; Masanobu Arai, and Takashi Shinozuka, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,975

Claims priority, application Japan, Dec. 28, 1982, 57-229070; Dec. 29, 1982, 57-229990; Jun. 14, 1983, 58-106206; Aug. 31, 1983, 58-159825; Nov. 16, 1983, 58-215562

Int. Cl.[4] H04M *1/76*

U.S. Cl. 179—16 AA **11 Claims**

9. A subscriber line interface circuit comprising:

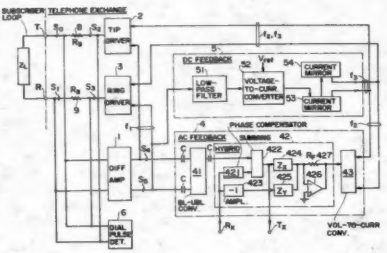
differential amplifier means having input and output terminals, said input terminals of said amplifier means being coupled through line terminals to a two-wire subscriber line for detecting a voltage difference developed across said line terminals;

first and second resistance means of equal resistance values, each of said resistance means having first and second ends, said first and second resistance means being respectively coupled at their first ends to said line terminals;

driver means having input and output terminals, said output terminals of said driver means being coupled to said second ends of said first and second resistance means for driving a load coupled to the distant end of said two-wire line;

first feedback means coupled from the output terminals of said differential amplifier means to the input terminals of said driver means for changing the impedance characteristics of said first and second resistance means so that a high impedance is synthesized across each of said first and second resistance means; and

second feedback means having a high-pass frequency response and third feedback means having a low-pass frequency response, said second and third feedback means being coupled from an output of said differential amplifier means to an input of said driver means, each of said second and third feedback means having a different passband



frequency characteristic, for reducing the synthesized impedances to a predetermined value, wherein said third feedback means comprises:

a low-pass filter having a time constant variable as a function of the amplitude of an input signal applied thereto from said differential amplifier means;

a voltage-to-current converter for converting a voltage output signal from said low-pass filter to a current output signal in accordance with a reference voltage; and

a pair of current mirror circuits coupled to the output of said voltage-to-current converter for supplying a current to said driver means.

4,600,812

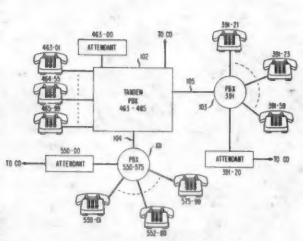
COMMUNICATION SYSTEM HAVING ABBREVIATED DIALING ACCESS

Robert R. Gerlits, Denver, Colo., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Nov. 23, 1984, Ser. No. 674,234

Int. Cl.[4] H04M *3/44, 7/00*

U.S. Cl. 179—18 AD **9 Claims**



1. An abbreviated dialing access communication system including a multiple node network, each node uniquely addressable using a location code including at least one digit of a dialing signal and each node comprising multiple stations each addressable using a station number address contained in said dialing signal, each of said nodes further comprising

means for determining if a node is the dialed node by receiving and comparing the received at least one digit location code

of the dialing signal with a unique location code assigned that node and

means responsive to said determining means for combining a subset of said at least one digit location code with the remaining digits of said received dialing signal for use as the dialed station number address at said dialed node.

4,600,813

LINE CONCENTRATOR

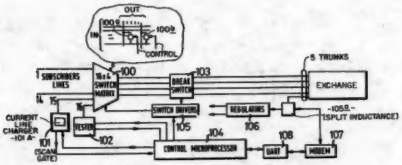
Gerald A. Pilling, Ipswich, England, assignor to British Telecommunications, London, England

Filed Aug. 19, 1983, Ser. No. 524,774

Claims priority, application United Kingdom, Aug. 24, 1982, 8224232

Int. Cl.[4] H04Q *1/22, 3/60*

U.S. Cl. 179—18 FC **14 Claims**



7. Apparatus for concentrating a plurality of telecommunication lines received as inputs to a fewer number of output lines, comprising:

a semiconductor switching matrix with a plurality of crosspoints for selectably connecting respective input lines to respective output lines;

switch operating means controlled by processing means and operative to make or break said crosspoints; and

a line-condition detector connected at a further input line to said switching matrix, and being connected by said switch operating means to successive ones of said input lines via a selectably variable pair of a plurality of pairs of crosspoints, each pair being associated with a usable output line, the line-condition detector thereby scanning the input lines and being operative to determine whether any input line requires connection to an output line.

4,600,814

AUTOMATED SYSTEM FOR ESTABLISHING TELEPHONE VOICE CONNECTIONS

William B. Cunniff, Glen Head, and Walter Tyler, Glen Cove, both of N.Y., assignors to Manufacturing Administrations Management Systems, Inc., Amityville, N.Y.

Filed Oct. 5, 1983, Ser. No. 538,770

Int. Cl.[4] H04M *3/46, 3/56*

U.S. Cl. 179—18 BC **25 Claims**

15. An automatic outgoing calling method for originating and controlling telephonic communication connections, in a high speed, repetitive manner and which can service a plurality of receivers each having a telephone number, comprising the steps of:

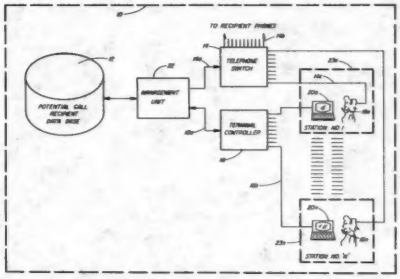
a. receiving by a telephone switch dialing signals from a call originator for the purpose of dialing a plurality of receivers and establishing connections between the dialed receivers and receiving control command signals for the purpose of establishing telephonic communication connections;

b. accessing stored data, by a computer or data terminal equipment (DTE) serving as a call originator, which data includes telephone numbers of said plurality of receivers to be called and creating from said stored data, combinations of at least two receivers to be called for the purposes of automatically connecting said receivers of said combinations;

c. creating by the DTE a data stream which is a string of characters in a predetermined format for each said combination of receivers to be connected which includes the telephone numbers of the receivers and control commands for the purpose of engaging the telephone switch, dialing said telephone numbers of one combination of receivers, connecting said one combination of receivers to each other and disengaging the telephone switch to permit the next connection of another combination of receivers to be initiated automatically;

d. outputting said data stream by the DTE;

e. receiving operational information by the DTE which indicates when the next data stream can be automatically outputted;



f. receiving by telecommunication equipment (DCE) said data stream from the DTE;

g. processing and converting by the DCE said data stream to said dialing signals and said control command signals for the purposes of engaging the telephone switch and dialing of the receivers and connecting at least two said receivers to each other and disengaging from the telephone switch;

h. firstly transmitting by the DCE said dialing and control command signals to the telephone switch; and

i. secondly transmitting by the DCE operational information to the DTE including an indication when the next connection of another combination of said receivers can be automatically serviced.

4,600,815

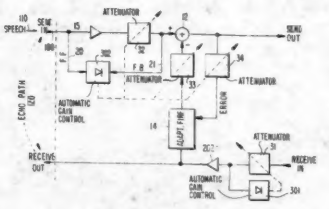
AUTOMATIC GAIN CONTROL FOR ECHO CANCELLERS AND SIMILAR ADAPTIVE SYSTEMS

Otakar A. Horna, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,449

Int. Cl.[4] H04B *3/20*

U.S. Cl. 179—170.2 **10 Claims**



1. In an echo canceller for cancelling an echo signal component from a composite signal, said echo canceller being of the type including prediction means for generating an output representing a predicted value of said echo signal component and subtraction means for subtracting a first signal representing

said predicted value from a second signal representing said composite signal, an automatic gain control circuit comprising:

first frequency-independent attenuator means for attenuating the output of said prediction means with a first frequency-independent attenuation factor to obtain said first signal; and

second frequency-independent attenuator means for attenuating said composite signal with a second frequency-independent attenuation factor substantially equal to said first attenuation factor to obtain said second signal.

4,600,816

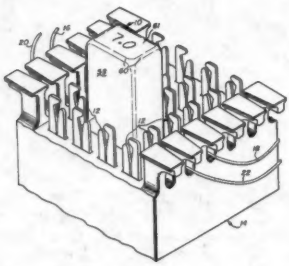
ATTENUATOR ADAPTED FOR CLIP MOUNTING TO CONNECTING BLOCK TERMINALS

Noel C. McDermott, Santa Cruz, Calif., assignor to Larus Corporation, San Jose, Calif.

Continuation of Ser. No. 414,898, Sep. 3, 1982, abandoned. This application Mar. 21, 1985, Ser. No. 715,067

Int. Cl.[4] **H01C** *1/028;* **H01R** *9/09;* **H03H** *7/24;* **H05K** *1/18*

U.S. Cl. 179—190 **1 Claim**



1. A device for introducing a known balanced attenuation into a telephone circuit including incoming and outgoing tip and ring lines at terminals of a telephone connecting block, wherein said device is mounted directly to said connecting block terminals, said device comprising:

a generally rectangular shaped substrate comprised of electrically conductive material;

a first conductive path disposed on said substrate, said first conductive path comprised of a thin metallic ribbon disposed on a first side of said substrate;

a second conductive path disposed on said substrate, said second conductive path comprised of a thin metallic ribbon disposed on said first side of said substrate, said second conductive path not contacting said first conductive path;

a third conductive path disposed on said substrate, said third conductive path comprised of a thin metallic ribbon disposed on a second side of said substrate, said third conductive path not contacting said first and second conductive paths;

a fourth conductive path disposed on said substrate, said fourth conductive path comprised of a thin metallic ribbon disposed on said second side of said substrate, said fourth conductive path not contacting said first, second and third conductive paths;

a first series resistor coupled to said first and second conductive paths for providing a resistive path between said incoming and outgoing tip lines;

a second series resistor coupled to said third and fourth conductive paths for providing a resistive path between said incoming and outgoing ring lines, said first and second series resistors having the same value of resistance;

a first shunt resistor coupled to said first and third conductive paths;

a second shunt resistor coupled to said second and fourth conductive paths, said first and second shunt resistors having the same value of resistance;

a first connecting means electrically coupled to said first conductive path, said first connecting means comprised of a flat strip of conductive material reversely bent at about the third points to form a first clip for mounting on said connecting block terminals;

a second connecting means electrically coupled to said second conductive path, said second connecting means comprised of a flat strip of conductive material reversely bent at about the third points to form a second clip for mounting on said connecting block terminals;

a third connecting means electrically coupled to said third conductive path, said third connecting means comprised of a flat strip of conductive material reversely bent at about the third points to form a third clip for mounting on said connecting block terminals;

a fourth connecting means electrically coupled to said fourth conductive path, said fourth connecting means comprised of a flat strip of conductive material reversely bent at about the third points to form a fourth clip for mounting on said connecting block terminals; and

a non-conductive cover for surrounding said substrate, said resistors and said conductive paths, said cover including an opening for access to said connecting means said cover partially filled with epoxy resin, said cover including a ridge on the outside thereof for grasping with fingers, said cover including markings for indicating the attenuation rating in decibels of said device;

whereby attenuation is provided to a single circuit of said tip and ring lines without separate block mounting or additional hardware.

4,600,817

APPARATUS FOR GUIDING FLEXIBLE SUPPLY LINES

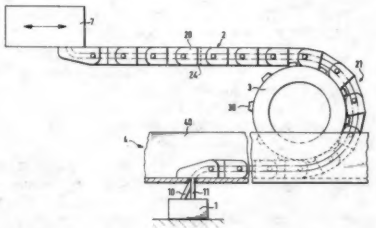
Willi Hackenberg, Eichstatt, Fed. Rep. of Germany, assignor to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 550,931

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241924

Int. Cl.[4] **H02G** *11/00;* **F16G** *13/16*

U.S. Cl. 191—12 C **21 Claims**



1. An apparatus for guiding flexible supply lines, said apparatus comprising:

a guide chain, connected to a stationary connection point on one end thereof and a mobile supply station on the other end thereof, for supporting said supply line; and

a return wheel, with said guide chain wrapped at least partially thereon, for maintaining a minimum loop curvature of a length of chain wrapped thereon, said wheel including a chain wheel which rolls freely upon a part of said guide chain and is driven by movement of said guide chain, wherein surplus length of said guide chain is taken up and laid down in a loop during movement of said supply station.

4,600,818
LEVER SWITCH

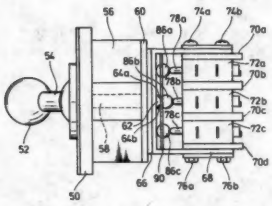
Katsuo Eto, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 29, 1984, Ser. No. 676,174

Claims priority, application Japan, Nov. 30, 1983, 58-184990[U]

Int. Cl.⁴ H01H *3/12*

U.S. Cl. 200—5 R **8 Claims**



1. A lever switch comprising:

(a) a plurality of microswitches arranged along a line and having respective pushbuttons;

(b) a plurality of first pressing members comprising rolling bodies, respectively, which are operatively provided adjacent to said pushbuttons;

(c) means for selectively holding said first pressing members at a predetermined position;

(d) a second sole pressing member provided adjacent to said first pressing members; and

(e) a lever member for displacing said second pressing member to selectively displace said first pressing members for selectively pressing said pushbuttons to open or close said microswitches.

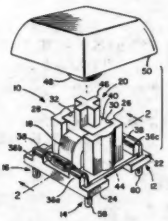
4,600,819
SWITCH ASSEMBLY

Robert H. Twyford, Great Falls, Va., assignor to Mechanical Enterprises, Inc., Herndon, Va.

Filed Mar. 8, 1985, Ser. No. 708,295

Int. Cl.⁴ H01H *13/52, 15/00, 1/02, 1/06*

U.S. Cl. 200—16 A **29 Claims**



1. A switch comprising:

a base;

a pair of wire conducting members secured to said base substantially collinear to each other with the ends thereof spaced apart, each said wire conducting member including a contact surface facing outward from the circumference of the wire conducting member;

an elongated contactor member, having a length at least as great as the distance between the contact surfaces of the wire conducting members, and disposed radially outward from, and in facing relationship with, the contact surfaces;

a resilient sleeve enclosing the contact surfaces and the spaced-apart ends of the wire conducting members, and encircling and supporting said elongated contactor member;

actuator means associated with said base to apply force through said resilient sleeve to said contactor member to displace said contactor member and said resilient sleeve to effect a closing of the contact surfaces by the contactor member.

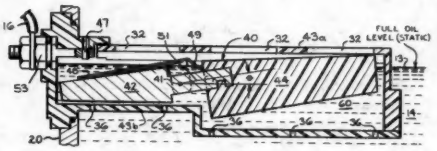
4,600,820
ELECTRICAL CUT OFF FLOAT SWITCH

John R. Bruder; Gerald M. Sivulka, both of Ann Arbor, Mich., and Leonard T. Tribe, Seal Beach, Calif., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Mar. 8, 1985, Ser. No. 709,619

Int. Cl.⁴ H01H *35/18*

U.S. Cl. 200—84 C **4 Claims**



1. A liquid level sensing electrical switch comprising:

(a) a balance beam float assembly having float means and counterweight means,

(b) electrical conducting pivot means positioned between said float means and said counterweight means whereby said balance beam float assembly is free to rotate about said pivot means in response to buoyant forces acting upon said float means as the liquid level rises and falls,

(c) electrical conducting switch means pivotal about and in electrical conducting relation with said pivot means,

(d) means whereby said switch means is caused to maintain a given position relative to said balance beam float assembly as said assembly rotates,

(e) electric terminal means positioned within the path of said switch means whereby said switch means makes electrical contact with said terminal means at a predetermined rotational position of said balance beam float assembly thereby completing an electric circuit between said electric terminal and said pivot means.

4,600,821
APPARATUS FOR INDUCTIVELY HEATING FLUID

Hans E. Fichtner, Krefeld, and Franz Klaus, Bochum, both of Fed. Rep. of Germany, assignors to Franz Klaus Union Armaturen Pumpen GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,626

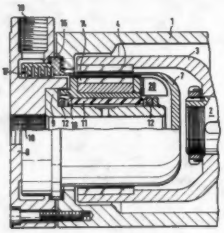
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207436

Int. Cl.⁴ H05B *6/10*

U.S. Cl. 219—10.51 **26 Claims**

1. An apparatus for heating a moving fluid comprising: a frame, a rotationally driven driver formed as a hollow cylinder and supported by said frame for rotation therein, magnet means on an inner face of said driver, a rotor formed as a cylinder and supported for rotation in said frame and placed therein with an outer face thereof opposite the inner face of said driver, magnet means on the outer face of said rotor, said driver being placed in relation to said rotor for rotationally driving the same by the attraction force of both said magnet means in response to rotation of said driver, a separating wall

between said opposite faces of said driver and said rotor, said wall being made of a material with a low electrical resistance,



and means defining ports in said frame for the inlet of fluid into said frame, over a face of said wall and out of said frame.

4,600,822

MICROSTRIPLINE FOR USE IN MICROWAVE HEATING

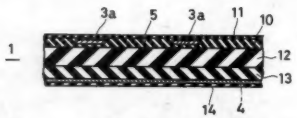
Yutaka Deguchi, Himeji, and Yoshitaka Shibata, Hyogo, both of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Feb. 22, 1984, Ser. No. 582,327

Claims priority, application Japan, Jul. 19, 1983, 58-132385

Int. Cl.[4] H05B *6/70*

U.S. Cl. 219—10.55 A **1 Claim**



1. A microstripline for use in a microwave heating apparatus, comprising:

a dielectric base plate having a first surface and a second surface;

a pair of conductors, one conductor of the pair being disposed adjacent the first surface of said dielectric base plate, and the other conductor of the pair being disposed adjacent the second surface of said dielectric base plate;

at least one of the conductors of the pair of conductors having a ladder pattern formed therein, the ladder pattern being defined by a plurality of slits formed in the at least one of the conductors;

the at least one of the conductors of the pair of conductors having said ladder patern being sandwiched between silicone resin; and

a coating member of low friction being disposed on a surface of the at least one conductor of the pair of conductors sandwiched between the silicone resin, the coating member including fluororesin.

4,600,823

INDUCTION HEATING APPARATUS HAVING ADJUSTABLE HEAT OUTPUT

Kiyoshi Hiejima, Shiga, Japan, assignor to Sanyo Electric Co., Ltd., Japan

Filed Jan. 2, 1985, Ser. No. 688,176

Claims priority, application Japan, Jan. 31, 1984, 59-16860; Apr. 17, 1984, 59-77774

Int. Cl.[4] H05B *6/12, 6/06*

U.S. Cl. 219—10.77 **21 Claims**

1. An induction heating apparatus comprising:

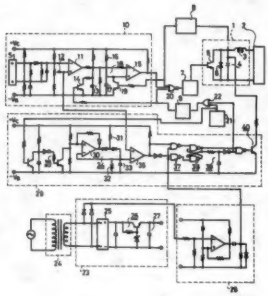
high frequency generating means for generating a high frequency current from a DC power source, said high frequency generating means including a heating coil responsive to said high frequency current for generating an alternating magnetic field;

output level setting means for setting an output level of said high frequency generating means;

comparing means for comparing a first signal level representing the output level of said high frequency generating means with a second signal level representing the output level set by said output level setting means;

frequency control means for controlling a frequency of said high frequency current generated in said high frequency generating means in response to an output of said comparing means; and

duty-cycle controlling means for controlling a duty ratio of an operating state and a stopping state of said high frequency generating means in response to said output level set by said output level setting means, said frequency of said high frequency current and said duty ratio of said high frequency generating means being controlled simultaneously by said frequency control means and said duty-cycle controlling means, respectively, in response to adjustment of said output level setting means, and at least one of said frequency control means and said duty-cycle controlling means having a characteristic of reducing the amount of change in the output of said high frequency generating means to be reduced in response to change in the amount of the adjustment of said output level setting means with increase in the output level set by said output level setting means.



4,600,824

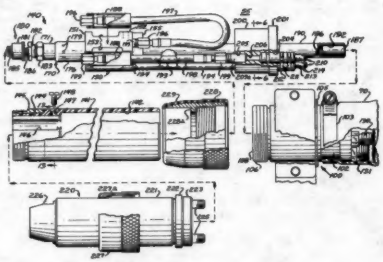
ARC WELDING SYSTEM AND DOCKING ASSEMBLY THEREFOR

Delford A. Moerke, 1020 Shady Oak Dr., North Mankato, Minn. 56001

Filed Sep. 10, 1984, Ser. No. 648,967

Int. Cl.[4] B23K *9/32*

U.S. Cl. 219—137.63 **20 Claims**



1. In an arc welding system including a welding torch at a

welding station wherein the torch has an electrode and utilities inputs for receiving from associated delivery means utilities including at least welding voltage and arc shielding gas, a quick connect and disconnect docking assembly for readily mounting and demounting the torch comprising: a docking body disposed at the welding station and having an electrode passage and at least one other utilities passage therethrough, means electrically and mechanically connecting said docking body to the associated utilities delivery means and receiving the shielding gas into said at least one other utilities passage, first coupling means on said docking body, and second coupling means non-removably mounted on the welding torch and forming a permanent part thereof, said first and second coupling means being removably engageable with each other for mounting the welding torch on said docking body in a mounted condition and providing electrical connection therebetween with the electrode disposed in said electrode passage and with the utilities applied to the utilities inputs of the welding torch, said first and second coupling means being manually engageable and disengageable to permit mounting and demounting of the torch without the use of tools.

4,600,825

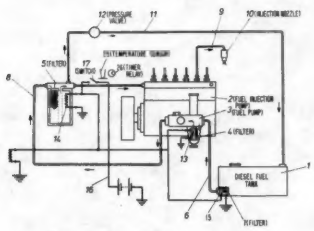
ELECTRICALLY HEATED DIESEL ENGINE FUEL CONVEYING SYSTEM

Walter Blazejovsky, No. 1-39/31/3 Schüttaustrasse, A-1220 Vienna, Austria

Continuation-in-part of Ser. No. 270,155, Jun. 3, 1981, abandoned. This application May 27, 1983, Ser. No. 498,664

Int. Cl.[4] F02M *31/00;* **B01D** *35/18;* **F24H** *1/10;* **H05B** *3/00*

U.S. Cl. 219—205 **12 Claims**



1. A system for conveying diesel fuel to a diesel engine comprising a pipe means, a first filter, a second filter downstream of and in series with the first filter and a fuel pump, each of said filters having an electrically heatable heating element located on a portion of the area of the surface of the filter and in the path of the diesel fuel, said heating element of each filter being supplied by a battery, the heating element wattage of the heating element of each filter being 1 watt to 1000 watts relative to a diesel engine power of 36 kW to 4500 kW, said portion of the areas of each filter heated by the heating element associated therewith being only 0.02 percent to 20 percent of the filter surface area of the filter relative to a diesel engine power of 36 kW to 4500 kW for melting paraffin deposits of the fuel on the heated portion of the filter surface.

4,600,826

HEATING TIME CONTROL MEANS FOR A HEATING APPLIANCE

Yozo Ishimura, Kashihara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

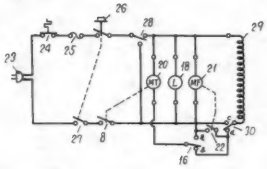
PCT No. PCT/JP83/00389, § 371 Date Jun. 26, 1984, § 102(e) Date Jun. 26, 1984, PCT Pub. No. WO84/01813, PCT Pub. Date May 10, 1984

PCT Filed Oct. 28, 1983, Ser. No. 626,836

Claims priority, application Japan, Nov. 5, 1982, 57-194947; Nov. 5, 1982, 57-194948; Nov. 5, 1982, 57-194949; Nov. 5, 1982, 57-194950

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—492 **4 Claims**



1. A heating appliance comprising:

a heating compartment for containing an object to be heated;

a heating means for heating the object in said compartment;

a power supply;

a steady power supply connecting means connected between said power supply and said heating means;

an intermittently operable power supply means connected between said power supply and said heating means in parallel with said steady power supply connecting means for intermittently supplying power and connectable to said heating means;

switching means for switching between the connection of the steady power supply connecting means and the intermittently operable power supply means to said heating means;

an electrically driven heating time control means settable for controlling the operating time of said heating means;

a drive means for setting said heating time control means;

a cam driven by said heating time control means and a lever engaged by said cam; and

a changeover switch operated by said lever and connected with said intermittently operable power supplying means and said time control means and also between said power supply and said time control means for changing the power supply to said time control means from an intermittent power supply to a continuous power supply after the passage of a predetermined time of operation of said time control means;

whereby the power supplied to the time control means is intermittently varied through said intermittently operable power supplying means to drive said time control means at a slower speed and then at a higher speed after the operation of said changeover switch by said lever driven by said time control means.

4,600,827

DUAL-POWERED PYROLYSIS PROBE DRIVING CIRCUIT

Gary C. Linwood, Newark, Del., and Robert Laragione, Christiana, Pa., assignors to AE/CDS Autoclave, Inc., Oxford, Pa.

Filed Sep. 28, 1984, Ser. No. 655,380

Int. Cl.[4] H05B *1/02*

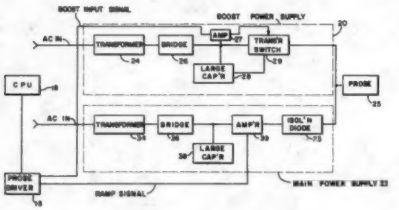
U.S. Cl. 219—492 **8 Claims**

1. A system for rapid energizaton of a delicate resistance element having extremely low thermal inertia, comprising:

(a) a first power supply coupled to said element which con-

stantly produces a steep electrical voltage pulse of a first predetermined value

(b) a second power supply independent of said first supply which continuously produces an electrical voltage of at least one second predetermined value, said second predetermined value being of substantially lesser magnitude than said first predetermined value, both of said independent supplies operating to produce their respective voltages simultaneously throughout an operation of said system,



(c) means for triggering said first power supply to apply said steep pulse to said resistance element only during an initial first predetermined time interval as a function of a desired ultimate maximum temperature of said element, and

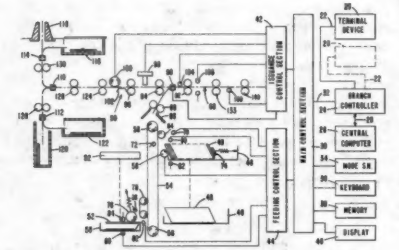
(d) means coupled to said (c) means and to said element for preventing said steep pulse from being applied to said second power supply, said last-named means also operating to enable said voltage produced by said second power supply to be applied to said resistance element throughout a predetermined second time interval immediately following said first time interval and in response to the cessation of the application of said steep pulse to said element.

4,600,828

AUTOMATIC ISSUANCE OF PASSBOOKS AND THE LIKE

Masaru Nogami, Odawara; Masafumi Inaba, Fujisawa, and Yoshitaka Oki, Chigasaka, all of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 24, 1984, Ser. No. 653,814
Claims priority, application Japan, Sep. 30, 1983, 58-180962
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 **13 Claims**



1. An apparatus for issuing passbooks or the like having a cover and at least one page comprising;

first storage means for storing a plurality of passbooks each in a closed position;

first means for selectively feeding a passbook from the first storage means into a feed path;

printing means positioned adjacent said feed path for printing data on the top surface of the passbook;

means positioned adjacent said feed path for turning the cover and the page of the passbook to an open position;

second means for feeding the passbook in the opposite direction along said feed path between said printing means and said turning means when operated;

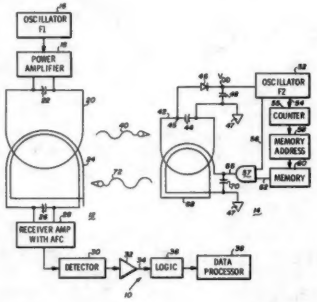
and control means for sequentially operating said first and second feeding means, said printing means and said page-turning means for printing data on the cover and the page of the passbook.

4,600,829

ELECTRONIC PROXIMITY IDENTIFICATION AND RECOGNITION SYSTEM WITH ISOLATED TWO-WAY COUPLING

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Apr. 2, 1984, Ser. No. 596,065
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—439 **12 Claims**



1. An electronic proximity recognition and identification system comprising:

a recognition section including an oscillator for supplying an electrical signal to a power amplifier electrically coupled to said oscillator, a first reader antenna connected to said power amplifier for radiating electromagnetic power responsive to said power amplifier, a second reader antenna for receiving signals, the mutual inductance between said first and second reader antennas being approximately zero; and

an electronic identifier section having a first identifier antenna for receiving radiated power from said first reader antenna, means for generating an identifier carrier frequency, and a second identifier antenna for radiating signals of said identifier carrier frequency to said second reader antenna, the mutual inductance between said first and second identifier antennas being approximately zero.

4,600,830

FOCUS DETECTING DEVICE

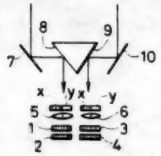
Seijiro Tokutomi; Osamu Shindo, and Hideaki Yuda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,780
Claims priority, application Japan, Sep. 6, 1982, 57-154773
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **6 Claims**

1. A focus detecting device comprising:

first and second light sensing means, each of said first and second light sensing means detecting light from adjacent

areas having different optical characteristics and being sensitive to a different range of wavelengths of light; and



means for detecting and summing outputs of said first and second light sensing means to provide a focus detection signal.

4,600,831

APPARATUS TO FOCUS LIGHT ON A SURFACE BASED ON COLOR

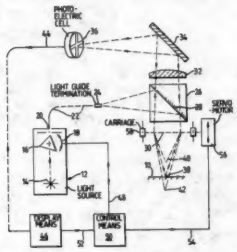
Michael C. Hutley, Teddington, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 21, 1983, Ser. No. 553,956

Claims priority, application United Kingdom, Dec. 7, 1982, 8234910

Int. Cl.[4] G02B *27/40*; G03B *3/00*

U.S. Cl. 250—201 **8 Claims**



1. Apparatus to focus light onto a given surface having a light focusing means which has appreciable chromatic aberration; a variable wavelength light source supplying light through said focusing means to said given surface; focus detecting means to receive light from the source reflected from said given surface; and control and indicating means responsive to the wavelength of the light source and to the focus detecting means to vary the wavelength of the light from the light source to maintain said light in focus on said given surface.

4,600,832

METHOD AND APPARATUS FOR AUTOMATIC OPTICAL FOCUSING ON AN OPTICALLY DISCERNIBLE FEATURE ON AN OBJECT

J. Evan Grund, San Jose, Calif., assignor to Nanometrics Incorporated, Sunnyvale, Calif.

Filed Oct. 28, 1983, Ser. No. 546,437

Int. Cl.[4] G03B *3/00*

U.S. Cl. 250—201 **13 Claims**

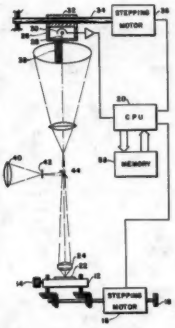
1. A method for the automatic fine focusing of an optical instrument having an image scanning means, said method comprising the steps of:

selecting an initial focusing distance between the instrument and an optically discernible feature on the object of interest;

operating the image scanning means of said instrument to make a plurality of at least three scans across said feature, one of said scans being made substantially at said initial focusing distance, each remaining scan in said plurality being made at different known distances, each different from that of said initial focusing distance;

noting the variations in measured light intensities as a function of position across the length of each scan of said plurality;

determining an edge value (E.V.) for each scan in said plu-



rality from said intensity variations as a function of said scan positions, a plot of said determined edge values as a function of corresponding distance, e, being a curve following the form: $E.V.=ae^2+be+c$;

determining the values of the coefficients, "a" and "b" in ssaid curve; and

determining optimum focal distance, "e_{best}", between said instrument and said object from the equation, $e_{best}=-b/2a$.

4,600,833

SOLID STATE IMAGE SENSING DEVICE WITH A COLOR FILTER

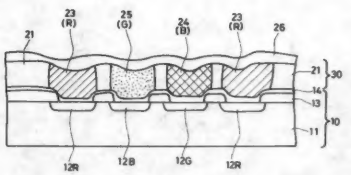
Hiroshi Shibata; Hiroyasu Toyoda, and Hidefumi Nakata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,402

Claims priority, application Japan, Mar. 29, 1982, 57-52402

Int. Cl.[4] H01J *3/14*

U.S. Cl. 250—216 **12 Claims**



1. A solid state image sensing device, comprising:

a photosensitive semiconductor element having at least one photocell on a surface thereof;

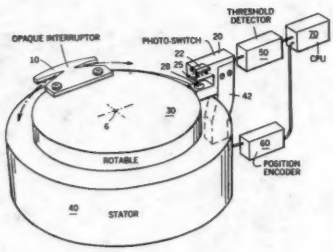
a transparent inorganic layer disposed on said surface to cover the photocell; and

at least one colored filter having inorganic coloring agents contained in regions of said inorganic layer in a position overlying said photocell.

4,600,834
PRECISION ZERO-HOME LOCATOR

William J. Stone, Kansas City, Mo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,278
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE **7 Claims**



1. A zero-home locator for use with first and second members, said first member being movable with respect to said second member in only one degree-of-freedom along a path of movement, said locator comprising:

switch means for changing from a first state to a second state when actuated, said switch being rigidly attached relative to said first member;

two actuator means for actuating said switch, said actuators being rigidly attached relative to said second member such that movement of said members can cause each actuator to actuate said switch;

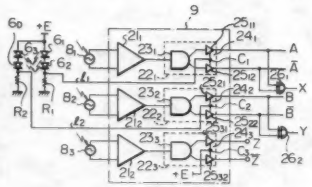
position indicator means for providing an indication of the position of said first member with respect to said second member when said switch is actuated by each actuator; and

means for averaging the indicated positions to provide the zero-home locator.

4,600,835
PULSE ENCODER HAVING A CIRCUIT FOR DIAGNOSING ABNORMALITIES

Hiroshi Ishida, Tokyo, and Shigeyuki Ushiyama, Hino, both of Japan, assignors to Fanuc Ltd., Japan

Filed May 26, 1983, Ser. No. 498,289
Claims priority, application Japan, May 26, 1982, 57-88005
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 SE **7 Claims**



1. A pulse encoder having a circuit for diagnosing abnormalities of a breakage of wiring in light-emitting elements of said pulse encoder, a lowering of power supply voltage applied to said pulse encoder, or a problem in an output transistor in a signal outputting element of said pulse encoder, which render an output signal of said pulse encoder indefinite, comprising:

at least one light-emitting element having a first electrode connected to a power supply and a second electrode connected through a resistor to the ground;

a rotary lattice plate having at least one first transparent portion for intermittently passing therethrough the light emitted from said light-emitting element;

a stationary lattice plate having at least one second transparent portion for passing therethrough part of the light passed through said first transparent portion of said rotary lattice plate;

at least one light-receiving element for receiving light passed through said second transparent portion so as to convert the light into an electrical signal; and

a driving unit in operable connection with said at least one light-receiving element for converting the electrical signal from said light-receiving element into a rectangular waveform signal, said driving unit having an output gate circuit for outputting said rectangular waveform signal during conditions of operation of the pulse encoder in the absence of said abnormalities, said output gate circuit having a control terminal for controlling the output signal of said driving unit, said output gate circuit providing a constant-potential output signal whenever a potential applied at said control terminal is lower than a predetermined value;

wherein said circuit for diagnosing abnormalities comprises:

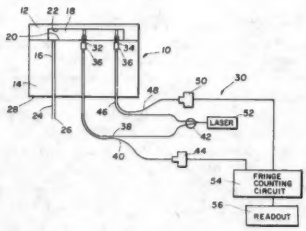
a lead wire connected at one end between the junction of said second electrode of said light-emitting element and said resistor, and at another end to said control terminal of said output gate circuit, for transferring said abnormalities from said light-emitting element to said output gate circuit; and

means in operable connection with said output gate circuit, for providing an alarm signal whenever said output gate circuit provides said constant-potential output signal.

4,600,836
DIAPHRAGM DEFLECTION SENSOR FOR FUSED SILICA DIAPHRAGM MODULE

John W. Berthold, III, Salem; Larry A. Jeffers, Alliance, and Larry B. Thompson, Salem, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 3, 1984, Ser. No. 596,481
Int. Cl.[4] G01D 5/34
U.S. Cl. 250—231 P **10 Claims**



1. A system for determining the deflection of a pressure transducer diaphragm, comprising:

a light source;

first means for transmitting the light produced by said light source to the diaphragm at a first location thereon, located at the approximate center of the diaphragm;

second means for transmitting the light produced by said light source to the diaphragm at a second location thereon, said first and second locations being radially offset from one another and located on one side of said diaphragm;

first means for intercepting the light reflected from said first location on the diaphragm;

second means for intercepting the light reflected from said second location on the diaphragm, said light reflected

from said first and second locations forming interference fringe patterns at their respective intercepting means;

first means for detecting said interference fringe patterns formed by the intercepted reflected light at said first intercepting means, and establishing output signals indicative thereof;

second means for detecting said interference fringe patterns formed by the intercepted reflected light at said second intercepting means, and establishing output signals indicative thereof;

third means for transmitting said intercepted reflected light forming interference fringe patterns from said first and second intercepting means to said first and second detecting means; and

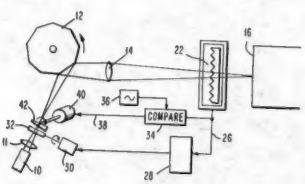
a fringe counting circuit, connected to said first and second detecting means, for: counting said output signals indicative of the interference fringe patterns formed at said first and second light intercepting means; comparing the output signals from said first detecting means with the output signals from said second detecting means to determine whether said output signals from both detecting means are simultaneously increasing or decreasing; and producing a determination as to the deflection of the pressure transducer diaphragm.

4,600,837

OPTICAL SCANNING APPARATUS WITH DYNAMIC SCAN PATH CONTROL

Thomas H. DiStefano, Bronxville, and Mark Johnson, Mt. Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1983, Ser. No. 557,491
Int. Cl.⁴ H01J *3/14*
U.S. Cl. 250—235 **32 Claims**



1. A scanning optical beam system comprising a primary scanning means which produces a scanning optical beam having a scan path close to the desired scan path, a photoresponsive error sensing means which measures over substantially the entire scan path the successive differences transverse to the scan direction between the actual position of the scanning beam and the desired position of the scanning beam and produces error signals, and a secondary scanning means connected to said error sensing means for response to said error signals and operable to dynamically correct the position of the scanning beam transverse to the scan direction during the course of the scan so as to reduce the measured errors.

4,600,838

METHODS AND APPARATUS FOR MEASURING THERMAL NEUTRON DECAY CHARACTERISTICS OF EARTH FORMATIONS

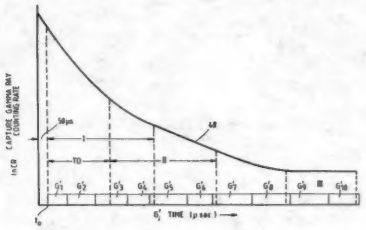
Donald K. Steinman, Missouri City, and Larry A. Jacobson, Richmond, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 20, 1984, Ser. No. 633,155
Int. Cl.⁴ G01V *5/00*
U.S. Cl. 250—270 **21 Claims**

1. A method for determining a thermal neutron decay characteristic of an earth formation, comprising the steps of:

(a) irradiating an earth formation with a discrete burst of fast neutrons;

(b) detecting indications of the thermal neutron concentration in the formation during a sequence of discrete time gates, said sequence of time gates beginning following a discrete time delay after the end of the neutron burst;



(c) determining the zeroth order moment of the indications during the sequence of discrete time gates;

(d) determining the first order moment of the indications during the sequence of discrete time gates; and

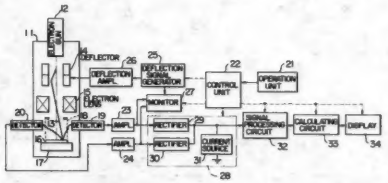
(e) forming a ratio of the first order moment of step (d) to the zeroth order moment of step (c) to obtain the thermal neutron decay time constant of the earth formation.

4,600,839

SMALL-DIMENSION MEASUREMENT SYSTEM BY SCANNING ELECTRON BEAM

Mikio Ichihashi, Kodaira; Satoru Fukuhara, Kokubunji; Masahide Okumura, Sagamihara, and Hisaya Murakoshi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1984, Ser. No. 576,324
Claims priority, application Japan, Mar. 9, 1983, 58-37389
Int. Cl.⁴ G01N *23/00*
U.S. Cl. 250—310 **4 Claims**



1. A small-dimension measurement system by scanning electron beam, comprising:

an electron source;

focusing and deflecting means for focusing an electron beam emitted from said electron source and for scanning a sample having opposite edge portions and a dimension therebetween which is to be measured;

signal detection means including at least one pair of detectors disposed symmetrically with respect to an electron-optical axis so that one detector in said detector pair faces one of said opposite edge portions of said sample while the other detector in said detector pair faces the other of said opposite edge portions, each of said one and other detectors detecting a position information signal from said sample through the scanning of the electron beam;

signal selection means for selected only that portion of the position information signal detected by said one detector which corresponds to position information of said one edge portion and only that portion of the position information signal detected by said other detector which corresponds to position information of said other edge portion

so that an influence of shadow effects by said edge portions of said sample which influence of shadow effects is contained in the position information signal detected by said pair of detectors is eliminated, said signal selection means comparing the position information signals separately detected by said one and other detectors and performing maximum detection; and

signal processing means for processing the signal portions selected by said signal selection means for conversion into the dimension between said opposite edge portions on said sample.

4,600,840

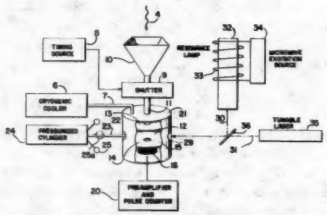
DOUBLE PHOTON EXCITATION OF HIGH-RYDBERG ATOMS AS A LONG-LIVED SUBMILLIMETER DETECTOR

Ara N. Chutjian, LaCrescenta, Calif., assignor to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 21, 1985, Ser. No. 703,847

Int. Cl.[4] G01J *5/36*

U.S. Cl. 250—338 **13 Claims**



1. A method of submillimeter detection comprising the steps of:

metering a quantity of rare gas from a pressurized cylinder into a cryogenically-cooled detection area;

photon exciting the rare gas atom by first subjecting it to a resonance lamp beam selected from the same rare gas;

causing a second photon excitation of the excited rare gas atom by subjecting it to a wavelength-tunable laser beam;

fully exciting the double-photon excited atom, by admitting into the detection area, a source of IR or submillimeter radiation to be measured;

impressing an ionization electric field across the fully excited atom; and

detecting the ion created by the field ionization as a measurement of the intensity of the submillimeter or IR irradiation.

4,600,841

APPARATUS FOR DETECTING MARKS ON A RUNNING WEB

Masateru Tokuno, Nishinomiya, and Yasuharu Mori, Amagasaki, both of Japan, assignors to Rengo Co., Ltd., Osaka, Japan

Filed Jul. 19, 1983, Ser. No. 515,257

Claims priority, application Japan, Aug. 6, 1982, 57-137789

Int. Cl.[4] G01N *21/86;* **G05B** *19/29*

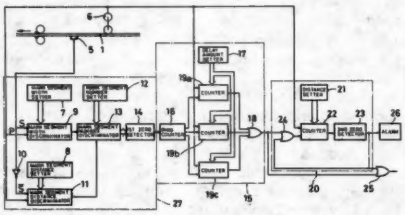
U.S. Cl. 250—548 **8 Claims**

1. A mark detector for detecting marks put on a running web with spacings therebetween, said marks each having at least one mark segment, comprising:

a sensor for sensing an object which is said mark segment or a printed or smudged area on the web;

a distance detecting means for detecting the distance for which the web has run; and

a mark detecting means which starts to count a signal output from said distance detecting means in response to a signal output from said sensor, and which outputs a mark detection signal only if the following three conditions are met; (1) the width of a detected object is within a preset first range corresponding to the width of said mark segment;



(2) the distance between detected objects is within a preset second range corresponding to the distance between said mark segments, and (3) the number of detected objects has become equal to a preset number of mark segments of which each mark consists.

4,600,842

SNOWFALL MEASURING METHOD AND APPARATUS

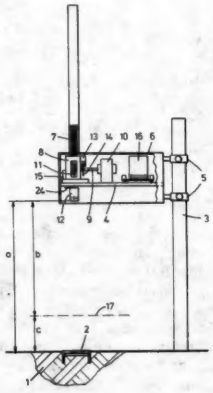
Marcel Boschung, Schmitten, and Beat Schmutz, Düdingen, both of Switzerland, assignors to Boschung Mecatronic AG, Canton of Fribourg, Switzerland

Filed Jan. 5, 1983, Ser. No. 455,644

Claims priority, application Switzerland, Jan. 15, 1982, 245/82

Int. Cl.[4] E01N *21/85*

U.S. Cl. 250—577 **20 Claims**



1. Apparatus for measuring the thickness of a layer of fallen snow deposited on a reference plate exposed to the free fall of snow, comprising:

a probe disposed at a rest position above said reference plate, said probe having means to generate a first stop signal when the probe encounters the surface of said layer and a second stop signal when the probe encounters a firm obstacle,

means for guiding said probe along a path leading from said rest position to said reference plate,

drive means with a regulating element operable in a first condition for moving said probe downward along said path from said rest position of said probe, and operable in a second condition to return said probe to said rest position,

means for stopping and switching over said drive means regulating element from said first condition to said second condition when said probe encounters either said reference plate or said layer of fallen snow and generates either of said stop signals,

means for generating electrical signals as a function of the downward distance travelled by said probe along said path,

evaluating means receiving said electrical signals and operable for determining said distance and for calculating said thickness of said layer of fallen snow on said reference plate, and

means for recording the calculated thickness.

4,600,843

PHOTOELECTRIC CONVERSION APPARATUS

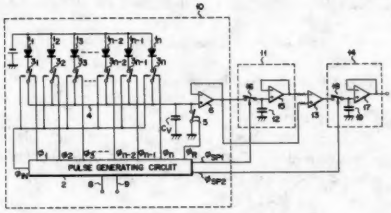
Shuji Kizu; Tsuyoshi Ishida, both of Yokohama; Kenichi Hiramatsu, Kawasaki, and Junji Miura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 27, 1983, Ser. No. 546,191

Claims priority, application Japan, Nov. 8, 1982, 57-195572

Int. Cl.[4] H01J *40/14*

U.S. Cl. 250—578 **6 Claims**



1. A photoelectric conversion apparatus comprising:

an array of photoelectric conversion elements, each of which produces an electric image signal component in response to a projected light;

a common output line;

a plurality of analog switches, each of which is connected between said common output line and the corresponding photoelectric conversion element;

a pulse generating circuit which produces a plurality of scanning pulses, which pulses subsequently scan said analog switches, for reading out said image signal components on said common output line, in succession, by turning ON each of said analog switches for a predetermined time period;

means for turning ON an analog switch during at least a first time period and a second time period which are equal in duration, during a predetermined time period in which said analog switch is scanned by a scanning pulse corresponding to said analog switch;

first means connected to said common output line and said pulse generating circuit, for use in obtaining a first signal produced during said first time period, which first signal includes said image signal component from a photoelectric element and a noise signal component, and for obtaining a second signal produced during said second time period, which second signal includes only said noise signal component;

second means connected to said first means and said pulse generating circuit, for holding said first signal for a predetermined time period; and

third means connected to said first means and said second means, for producing said image signal component by subtracting said second signal from said first signal.

4,600,844

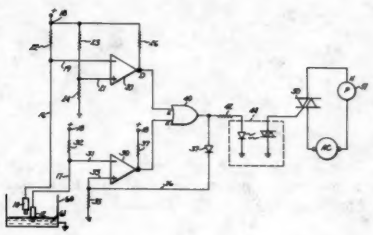
LIQUID LEVEL CONTROL APPARATUS

Donald G. Atkins, Cedar, Minn., assignor to The Marley-Wylain Company, Mission Woods, Kans.

Filed Jun. 7, 1984, Ser. No. 617,957

Int. Cl.[4] H01H *35/18*

U.S. Cl. 307—118 **6 Claims**



2. A control circuit controlling a medium between predetermined upper and lower limits in a system including medium control means operable to vary said medium at least from said upper limit below said lower limit, said circuit comprising:

upper and lower limit single conductor electrical probes operable to detect the presence of said medium at upper and lower limits respectively;

upper and lower limit differential comparator means connected at an input to said upper and lower limit probes respectively, producing upper and lower limit signals respectively when said medium is detected by said probes;

p1 logic means receiving said upper limit signal and producing a control signal in response thereto, said control signal used to cause said medium control means to vary said medium toward said lower limit;

reference voltage control means supplying a first reference voltage to a second input of said lower limit comparator in the absence of said control signal to prevent said lower limit comparator from producing said lower limit signal and operable in response to said control signal to vary said first reference voltage to permit said lower limit comparator to produce said lower limit signal when the presence of the medium is detected by said lower limit probe; and

said logic means further receiving said lower limit signal and further responsive thereto to produce said control signal whereby said medium is automatically maintained below said upper limit.

4,600,845

FAULT-TOLERANT CLOCK SYSTEM

John F. McKenna, Jr., Gloucester, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Dec. 30, 1983, Ser. No. 567,249

Int. Cl.[4] H03K *5/00, 3/017*

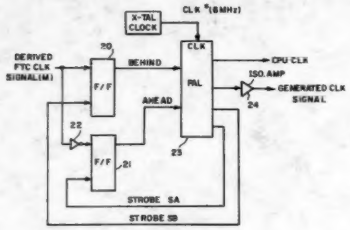
U.S. Cl. 307—269 **11 Claims**

1. A circuit for maintaining an output signal in phase with an input signal, said output signal and said input signal each comprising a plurality of pulses, said pulses having a frequency substantially higher than the frequency of said input and output signals, one pulse of said plurality of pulses being omitted in each cycle of said input and output signals to form a dead interval therein when said signals are in phase, said circuit comprising

means responsive to said input signal and to said output signal for comparting the phase of said output signal relative to that of said input signal at the start of a cycle of each of said signals;

logic circuit means including means responsive to a said phase comparing means for controlling the length of cycle of the output signal when the output signal is not in phase with the input signal by omitting said dead interval to

shorten said cycle when the phase of said output signal is behind that of said input signal and by inserting a second



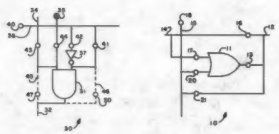
dead interval to lengthen said cycle when the phase of said output signal is ahead of that of said input signal.

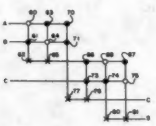
4,600,846

UNIVERSAL LOGIC CIRCUIT MODULES

James L. Burrows, Merrimack, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 6, 1983, Ser. No. 539,504
Int. Cl.[4] H03K *19/177, 19/20;* G06F *7/50*
U.S. Cl. 307—465 **13 Claims**





1. An integrated logic circuit comprising a plurality of logic cells each performing a conventional basic logic function on input signals from lines arrayed in a substantially rectangular grid arrangement defining generally horizontal and vertical directions, each of said logic cells including a logic gate for performing the logic function having two input terminals and an output terminal, one of said input terminals and said output terminal being connectable either to one of the horizontally or vertically arrayed lines or to means for providing a constant enabling signal, said other input terminal being connected to connection means that connects said other input terminal to the other of the horizontally or vertically arrayed lines, for coupling the input signal thereon to said other input terminal of said logic gate, and a contact connected to said output terminal and the output line for selectively allowing a conductor means to be deposited thereon between either of said input terminals and the output line.

4,600,847

PREDISTORTION EQUALIZING CIRCUIT

Peter N. Baum, Bedford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 24, 1984, Ser. No. 685,829
Int. Cl.[4] H03F *1/32*
U.S. Cl. 307—491 **4 Claims**

1. An equalizing circuit for predistorting an input signal to be applied to a light emitting diode to compensate for second order distortion caused by said light emitting diode comprising

an NPN transistor having a collector, a base, and an emitter;

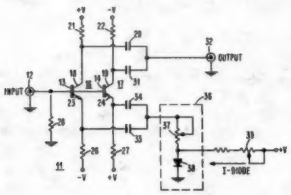
a PNP transistor having a collector, a base, and an emitter;

means for coupling an input signal to said bases of said transistors;

first impedance means for coupling said collector of said NPN transistor to a source of positive potential;

second impedance means for coupling said collector of said PNP transistor to a source of negative potential;

third impedance means for coupling said emitter of said NPN transistor to a source of negative potential;



fourth impedance means for coupling said emitter of said PNP transistor to a source of positive potential;

means for coupling said collectors to said light emitting diode; and

emitter resistance means including

a serially connected first variable resistance and semiconductor diode coupled as a dynamic emitter load resistance across said emitters and a point of reference potential, and

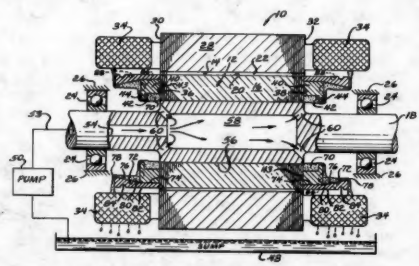
a second variable resistance coupling one electrode of said semiconductor diode to a voltage source of such polarity as to cause current to flow through said semiconductor diode.

4,600,848

COOLING OF DYNAMOELECTRIC MACHINES

Thomas A. Sutrina, and Timothy J. Bland, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 24, 1985, Ser. No. 738,053
Int. Cl.[4] H02K *9/19*
U.S. Cl. 310—54 **8 Claims**



1. In a dynamoelectric machine, the combination of

a stator including an armature having opposed ends with winding end turns extending therefrom;

a rotor journalled within said stator and separated therefrom by an annular air gap, said rotor including a body of magnetizable material having opposed end faces nominally axially aligned with said armature ends and end conductors extending axially from each of said faces;

means for introducing a liquid coolant into said rotor;

means defining a first annular weir on said rotor in heat transfer relation with at least one of said end conductors

and located radially inwardly thereof in axial alignment therewith and in fluid communication with said introducing means; and

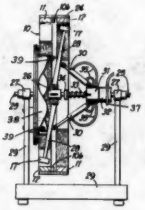
means defining a second annular weir on said rotor and located radially outwardly of said one end conductor and axially outwardly of said first weir, said second weir having an annular lip axially aligned with the winding end turn at the adjacent armature end so that coolant overflowing the lip of said second weir will be sprayed on such winding end turn.

4,600,849

FLUID-ACTIVATED MOTOR HAVING MAGNETIC PROPULSION

William J. Lawson, R.D. 1, Box 299E, and Robert J. Lawson, 129 Union St., both of Milton, Del. 19968

Filed Jan. 23, 1985, Ser. No. 693,900
Int. Cl.⁴ H02K *49/00*
U.S. Cl. 310—103 **12 Claims**



1. A permanent magnet motion conversion device comprising a stator consisting of a plurality of arcuate circumferentially extending and circumferentially spaced stator magnet segments having exterior and interior faces of opposite polarities, a like number of arcuate circumferentially extending stator magnet segments intervened circumferentially with the first-named stator magnet segments and forming therewith a substantially continuous annular permanent magnet stator, the second-named stator magnet segments having exterior and interior faces of opposite polarities which are the reverse of the polarities of the exterior and interior faces of the just-named stator magnet segments, at least as rotor permanent magnet adapted to coact drivingly with the stator magnet segments and having end faces of opposite polarities, said rotor magnet between its end faces extending substantially circumferentially of the stator, at least the first-named stator magnet segments and the rotor magnet having mutually perpendicular magnetic flux fields with the flux field of the rotor magnet adapted to enter and be contained wholly within the flux field of each first-named stator magnet segment, and external power means to rock the rotor magnet generally axially of the stator in near proximity to the first and second named stator magnet segments, whereby during rotor rotation the rotor magnet traverses circumferentially each first-named stator magnet segment while circumventing each second-named stator magnet segment during a full rotational cycle of the device.

4,600,850

BRUSH-HOLDER FOR DISC COMMUTATOR OF ROTATING ELECTRIC MACHINES

Alfred B. Mazzorana, Venissieux, and Francis Froment, Lyons, both of France, assignors to Societe Paris-Rhone, Lyons, France

Filed Oct. 25, 1984, Ser. No. 664,725
Claims priority, application France, Nov. 4, 1983, 83 17766
Int. Cl.⁴ H02K *13/00*
U.S. Cl. 310—242 **7 Claims**

1. A brush and holder assembly for a rotating electric machine having a commutator disc disposed normal to an axis of a shaft of its armature, and the machine having a body with an end surrounding the armature and commutator disc, the brush and holder assembly comprising:

(a) a brush holder shaped to fit the end of the body and having axial brush guides extending toward the commutator disc, and the holder having a cavity;

(b) a brush in each of said guides, each of said brushes having an inner end contacting the commutator disc and having an outer end;

(c) a single spring for pressing of said brushes toward the commutator disc, the spring having two windings shaped to fit and be housed in the cavity, adjacent ends of the

windings being mutually joined together by a central loop extending offset from the windings, and the spring having two legs extending respectively from other ends of the windings and each of said legs having an end extending to and overlying the outer end of each of brushes;

(d) insulating means between ends of the legs and the outer end of each of the brushes; and

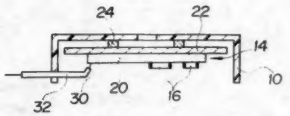
(e) retaining catch means adjacent to the cavity and operative to receive and retain the loop, the loop and said retaining catch means being positioned with respect to said cavity to urge the ends of the legs of the spring toward the outer ends of the brushes.

4,600,851

PIEZOELECTRIC BUZZER WITH CIRCUIT ELEMENTS MOUNTED ON NODAL AREAS

Teruo Isayama; Yukinobu Takeuchi; Yoshikazu Ikeda; Sigeuki Kondo, and Seiichi Yoshikawa, all of Kosai, Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 599,748, Apr. 11, 1984, abandoned. This application Aug. 19, 1985, Ser. No. 767,084
Int. Cl.⁴ H01L *41/08*
U.S. Cl. 310—324 **7 Claims**



1. In a piezoelectric buzzer comprising a tone generator and an oscillation circuit, said tone generator comprising a resilient thin plate and a piezoelectric element having formed thereon conductive thin film electrodes and bonded to said resilient thin plate, and said oscillation circuit being formed by electronic parts connected to said electrodes, the improvement wherein:

said piezoelectric element is formed on the upper surface thereof with a conductive carrying area of a predetermined pattern along nodal points where amplitude of vibration of said tone generator is zero, and the location of said nodal points being determined by a specific frequency of said vibration which is determined by factors including the thickness and diameter of said tone generator; and

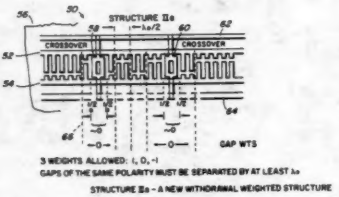
said electronic parts are fixedly mounted on said carrying area to constitute said oscillation circuit.

4,600,852

WIDE BANDWIDTH WITHDRAWAL WEIGHTED SURFACE ACOUSTIC WAVE FILTERS

Edward M. Garber, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 30, 1984, Ser. No. 666,431
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—313 B 10 Claims


STRUCTURE IIa
CROSSOVER
CROSSOVER
GAP WTS
3 WEIGHTS ALLOWED: 1, 0, -1
GAPS OF THE SAME POLARITY MUST BE SEPARATED BY AT LEAST λ₀
STRUCTURE IIa - A NEW WITHDRAWAL WEIGHTED STRUCTURE

1. Transducer element for use in broadband surface acoustic wave filter comprising:

a piezoelectric substrate;

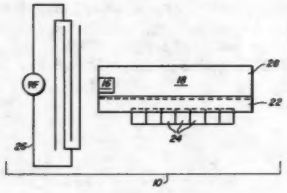
a pair of withdrawal weighted conductive comb structures having interdigitated fingers; and further including at least one spacer element means disposed within said comb structure, said spacer element means adapted to produce half weight gaps.

4,600,853

SAW-CTD SERIAL TO PARALLEL IMAGER AND WAVEFORM RECORDER

Robert R. Whitlock, College Park, and Nicolas A. Papanicolaou, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1985, Ser. No. 768,651
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—313 B 13 Claims



1. A waveform recorder comprising:

a semiconductor body;

a planar piezoelectric body having a main surface overlying and in proximity to the semiconductor body;

wave propogation means for propogating acoustic waves on the main surface of the piezo-electric body to create traveling potential wells in the underlying semiconductor body;

a traveling potential well path located in the semiconductor body, the traveling potential well path beginning at the wave propagation means and extending straight away therefrom;

charge injection means for injecting into the potential wells travelling past a first location in the semiconductor body a quantity of minority charge carriers whose magnitude tracks with time the waveform of a signal to be recorded, the first location of the charge injection means being located near the start of and in the travelling potential well path;

semiconductor depletion means for depleting the semiconductor of majority charge carriers along the traveling potential well path, said depletion means located atop the piezoelectric body;

a gate located on the semiconductor body and alongside and parallel to the traveling potential well path and overlapping the semiconductor depletion means;

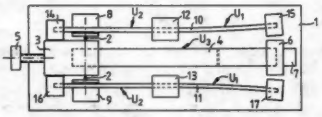
a plurality of static wells in the semiconductor body aligned next to each other and running parallel to, alongside and overlapping the gate so charge carriers injected into the traveling potential wells at each of a plurality of instants in time will proceed into their respective static wells of the plurality of static wells when the potential across the gate is lowered, the gate having length at least equal to the length of the plurality of static wells.

4,600,854

PIEZOELECTRIC STEPPING ROTATOR

Johannes G. Bednorz; Martin A. Lanz; Hermann Nievergelt, and Wolfgang D. Pohl, all of Adliswil, Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 28, 1984, Ser. No. 655,271
Claims priority, application Switzerland, Mar. 5, 1984, 104926/84
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—331 5 Claims



1. Apparatus for attaining discrete radial displacements with respect to a frame comprising;

a frame having a rotatable shaft through its center;

piezoelectric positioning means in said frame comprising at least one piezoelectric positioning rod having a first end affixed to said rotatable shaft and a second end having means adapted for being arrested;

at least one pair of piezoelectric arresting means, one of said pair being disposed on each side of said piezoelectric positioning means, a respective one of which comprises a first ring member fixedly mounted to said frame and radially disposed about said shaft, a second ring member for arresting said means for being arrested and at least one piezoelectric bar having a first end associated with said first ring member and a second end associated with said second ring member;

first electrode means for actuating said piezoelectric positioning means to achieve radial displacement of said positioning means and consequent rotation of said rotatable shaft with respect to said frame;

locking means controllable for engaging said rotatable shaft;

second electrode means for controlling said locking means; and

third electrode means for actuating said piezoelectric arresting means, thereby to control said second ring members for arresting, whereby said second ring members are made to disengage said means adapted for being arrested to allow displacement, upon actuation by said first electrode means, of said second end of said positioning means while said locking means engages said rotatable shaft, and alternately are made to arrest said means adapted for being arrested while said locking means disengages said shaft allowing rotation of same.

4,600,855

PIEZOELECTRIC APPARATUS FOR MEASURING BODILY FLUID PRESSURE WITHIN A CONDUIT

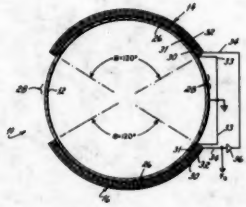
J. Scott Strachan, Edinburgh, Scotland, assignor to Medex, Inc., Hilliard, Ohio

Continuation-in-part of Ser. No. 715,136, Mar. 22, 1985, which is a continuation-in-part of Ser. No. 653,978, Sep. 24, 1984. This application May 30, 1985, Ser. No. 739,188

Claims priority, application United Kingdom, Sep. 28, 1983, 8325861

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—338 20 Claims



1. In a system for measuring bodily fluid pressure, a transducer connectable to a dome containing fluid under pressure, said fluid under pressure being hydraulically coupled to the source of said bodily fluid, said dome having a first diaphragm which flexes in response to variations in fluid pressure, said transducer comprising:

a housing connectable to said dome;

a plate having at least one natural resonant frequency which varies as mechanical stress applied to it varies;

means for connecting said plate between said housing and said first diaphragm to apply varying stress to said plate as said first diaphragm flexes;

a pair of piezoelectric sheet transceivers, each in intimate contact with a respective portion of said plate;

electronic means for energizing one of said piezoelectric transceivers to vibrate said plate at its resonant frequency; and

said other piezoelectric transducer producing a signal proportional to the frequency of vibrations of said plate, said signal thereby being indicative of said bodily fluid pressure.

4,600,856

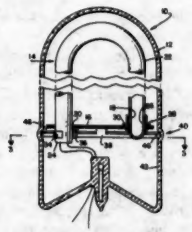
COMPACT LOW PRESSURE ARC DISCHARGE LAMP

Andre C. Bouchard, Peabody; Paul A. Thibault, Danvers, and Rudolph V. Marcucci, Beverly, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed May 21, 1984, Ser. No. 612,272

Int. Cl.[4] H01J *61/30, 61/42*

U.S. Cl. 313—25 5 Claims



1. A low pressure arc discharge lamp comprising: an hermetically sealed, visible light transmitting envelope containing an arc generating and sustaining atmosphere; and an assembly mounted within said envelope, said assembly comprising a base plate having first and second apertures therein and a "U" shaped, discharge path defining tube having an electrode at each end of said discharge path associated with said apertures; one end of said tube being frictionally engaged with said first aperture and the other end of said tube passing through said second aperture and being positioned by a spring clip engaging said end and being affixed to a planar surface of said base plate.

4,600,857

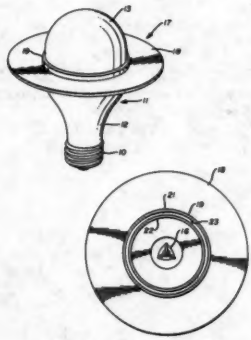
LAMP WITH INTEGRAL HEAT SINK

Craig Suhar, 2471 Chaney Clr., Youngstown, Ohio 44509

Filed Apr. 5, 1984, Ser. No. 597,058

Int. Cl.[4] H01K *1/28, 1/58;* H05K *3/20*

U.S. Cl. 313—35 4 Claims



1. A lamp with integral heat sink for radiation of heat comprising a lamp base, a translucent lamp body having first and second lamp portions, said first lamp portion secured to said lamp base, a filament within said lamp body, a centrally apertured heat transfer fin intersecting the lamp body and extending into said lamp body adjacent said filament, means for securing said heat transfer fin to said first and second lamp portions.

4,600,858

COLOR CATHODE RAY TUBE APPARATUS TO MODIFY DEFLECTION MAGNETIC FIELDS

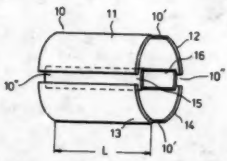
Katsuyo Iwasaki, Nishinomiya; Osamu Konosu, Nagaokakyo; Atsushi Kihara, Uji, and Masayasu Kamada, Muko, all of Japan, assignors to Matsushita Electronics Corp., Kadoma, Japan

Filed May 10, 1984, Ser. No. 609,009

Claims priority, application Japan, May 18, 1983, 58-86994

Int. Cl.[4] H01J *29/50*

U.S. Cl. 313—413 14 Claims



1. In a color cathode ray tube apparatus having an in-line electron gun which has a beam outlet portion and upon which a vertical and a horizontal deflection magnetic field are to be applied, and having a phosphor screen upon which electron

beams from said electron gun are directed to form beam spots, an apparatus for modifying said vertical and said horizontal deflection magnetic fields so that said beam spots are substantially circular, comprising:

first, second, third and fourth magnetic pole pieces, each having an arc-shaped cross section, together forming a cylindrical-shaped surface through which a vertical central plane and a horizontal central plane pass such that a line formed by the intersection of said planes is colinear with a central axis of said cylindrical surface, said cylindrical surface adapted for connection to said beam outlet portion inside of said cathode ray tube and having circumferential gaps between neighboring pole pieces, said gaps located on said vertical and said horizontal central planes; and

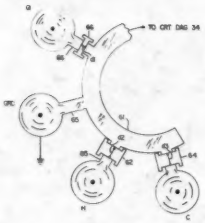
fifth and sixth magnetic pole pieces of oblong shape disposed inside said cylindrical surface at positions to cover said gaps on said horizontal central plane at a predetermined distance from said cylindrical surface, to modify said vertical and said horizontal deflection magnetic fields.

4,600,859

CATHODE RAY TUBE PROTECTION SYSTEMS

Gregory J. Beaumont, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 19, 1984, Ser. No. 601,779
Int. Cl.[4] H01J *21/20;* H02H *1/00*
U.S. Cl. 315—3 **8 Claims**



1. A socket assembly for a CRT having a conductive "dag" and including an electron gun having electrodes susceptible to high voltage arcing comprising;

a plurality of spark gap means in said socket assembly, at least a first of said spark gap means being activated in the presence of abnormal high voltage for providing an energy discharge path for a high voltage arc; and

a second of said spark gap means being larger than said first spark gap means such that a low impedance circuit associated therewith is precluded from a secondary discharge of energy as a result of said arc.

4,600,860

RAPID-START FLUORESCENT LAMP CLOSURE SWITCH

Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

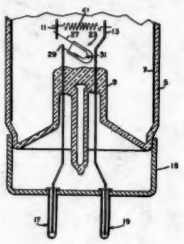
Continuation-in-part of Ser. No. 582,671, Feb. 23, 1984, abandoned. This application Jan. 13, 1986, Ser. No. 818,997
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—73 **11 Claims**

1. A circuit breaker for use in a rapid-start fluorescent lamp comprising:

a sealed glass bottle;

first and second electrical conductors sealed into and passing through said glass bottle; and

a thermally-sensitive bimetal strip disposed within said bottle and having first and second end portions separated by an intermediate portion, said first end portion being affixed to said first electrical conductor, said second end portion being formed in a substantially boot-shaped configuration having a foot member for effecting edge contact with said second electrical conductor and a leg member extending from said foot member and said intermediate portion angularly attached to said leg member and arched to connect to said first end portion whereby said foot member and said intermediate portion are formed to establish edge contact with said second electrical conductor, said bimetal strip being formed for disengagement from said second electrical conductor at a given range of bottle temperatures and for engagement therebetween at bottle temperatures below and above said given range of bottle temperatures.

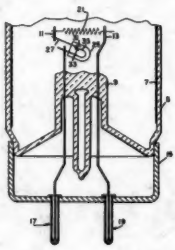


4,600,861

FLUORESCENT LAMP CIRCUIT BREAKER

Ronald E. Sindlinger, Muncy, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 582,673, Feb. 23, 1984, abandoned. This application Jan. 6, 1986, Ser. No. 817,754
Int. Cl.[4] H01J *7/44*
U.S. Cl. 315—73 **10 Claims**



1. A circuit-breaker for use in a rapid-start fluorescent lamp comprising:

a bulb;

first and second electrical conductors sealed into and passing through said bulb; and

a thermally-sensitive bi-metal strip disposed within said bulb and having first and second end portions, said first end portion being affixed to said first electrical conductor and said second end portion and said second electrical conductor being formed to provide a straight member extending within a U-shaped member having first and second leg members with said straight member and said first leg member electrically connected at ambient bulb temperature and electrically disconnected at a given range of temperatures higher than ambient bulb temperature and said straight member and said second leg member electrically connected at a bulb temperature higher than said given range of bulb temperatures.

4,600,862

DISCHARGE LAMP OPERATION APPARATUS

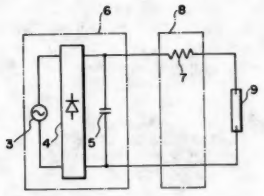
Kazuhiko Ito, Moriguchi; Takashi Katsura, Osaka; Masataka Ozawa, Hirakata; Kazutaka Koyama, Nishinomiya, and Yoshiro Ogata, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Oct. 5, 1984, Ser. No. 658,414

Claims priority, application Japan, Oct. 12, 1983, 58-190107; Nov. 15, 1983, 58-215422

Int. Cl.[4] H01J *17/20, 11/04*

U.S. Cl. 315—358 2 Claims



1. A discharge lamp operation apparatus comprising a d.c. power supply, a ballast connected to the output terminal of said d.c. power supply, and a high-pressure sodium lamp connected to said d.c. power supply through said ballast and adapted to be operated by a current containing a d.c. component, wherein the relation between the ratio of the distance l (mm) between the electrodes to the inner diameter d (mm) of the arc tube of the high-pressure sodium lamp and the sodium vapor pressure P_{Na} (kPa) in the arc tube is set to $P_{Na} \geqq 6.0$ (l/d − 5.8).

4,600,863

METHOD OF AND APPARATUS FOR ACTIVE VIBRATION ISOLATION

George B. B. Chaplin, and Roderick A. Smith, both of Colchester, United Kingdom, assignors to Sound Attenuators Limited, Colchester, United Kingdom

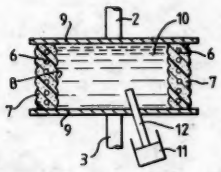
PCT No. PCT/GB83/00116, § 371 Date Dec. 19, 1983, § 102(e) Date Dec. 19, 1983, PCT Pub. No. WO83/03700, PCT Pub. Date Nov. 27, 1983

PCT Filed Apr. 19, 1983, Ser. No. 568,201

Claims priority, application United Kingdom, Jan. 13, 1983, 8300809; Apr. 19, 1983, 8211215

Int. Cl.[4] H02K *33/00*

U.S. Cl. 318—114 8 Claims



1. A method of reducing the transmission of vibration along a path leading from a source of vibration to a mounting of that source, which method comprises the employment of at least one vibration actuator and the energization of each actuator to reduce the effect of source-derived vibration on said mounting, the improvement which involves including shear decoupling means in the vibration path between the source of vibration and the mounting by forming each actuator as a volume of incompressible fluid defined in part by a peripheral containing wall which allows shear movements between the axial ends thereof but which is substantially resistant to radial expansion on a pressure rise within said volume, whereby the actuator has a much higher compliance in the transverse direction than in the axial direction.

4,600,864

EASILY RESTARTED BRUSHLESS DC MOTOR

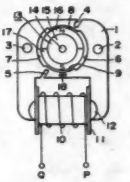
Hironobu Sato, Ohta, Japan, assignor to Sanyo Electric Co., Ltd., Osaka and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Jan. 23, 1985, Ser. No. 694,166

Claims priority, application Japan, Feb. 1, 1984, 59-17384; Feb. 28, 1984, 59-38249; Jul. 4, 1984, 59-138760

Int. Cl.[4] H02K *29/08*

U.S. Cl. 318—254 6 Claims



1. A brushless motor comprising a stator core, a rotor having permanent magnets disposed around a rotor core of said rotor, a stator coil providing magnetic flux for exciting said rotor, a rotational position sensor for detecting a rotational position of said rotor, and a controller for controlling polarity of electrical power supplied to said stator coil in accordance with an output from said position sensor, wherein:

(i) said stator core is made of a plurality of laminated electrical steel sheets, each of said electrical steel sheets having a substantially round aperture and being disposed around said aperture such that a closed magnetic circuit is formed around said aperture and such that a bore for receiving said rotor is formed by said aperture when said plurality of electrical steel sheets are laminated;

(ii) said stator coil is composed of single coil with a pair of terminals, said stator coil being mounted on one side of said bore of the stator core;

(iii) said rotational sensor is composed of a single magnetic, non-mechanical sensor which is disposed on said stator core adjacent to an outer surface of said rotor;

(iv) the polarity of the electrical power of said stator coil is alternately switched over by said controller; and

(v) said bore of said stator core has a shape such that a continual air gap is formed between a wall of said bore and an outer surface of said rotor, said air gap having portions containing a large gap and portions containing a small gap arranged alternately on a circumferential surface of said bore.

4,600,865

TRANSPORTATION APPARATUS

William R. Caputo, Wyckoff, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 29, 1984, Ser. No. 666,065

Int. Cl.[4] H02P *3/04*

U.S. Cl. 318—274 13 Claims

1. Transportation apparatus, comprising:

a conveyor,

and at least one drive for said conveyor,

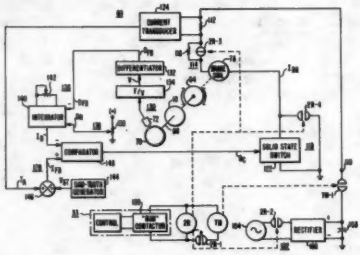
said at least one drive including:

(a) an electric motor for driving said conveyor, and

(b) an electrically controlled brake, including a brake coil and a brake controller for decelerating said conveyor when the electric motor ceases to drive said conveyor,

said brake controller including a deceleration servo loop and an inner current loop,

said deceleration servo loop including means providing a first signal having a constant magnitude representing the desired deceleration rate of the conveyor, and means responsive to movement of said conveyor for providing a



second signal responsive to the actual deceleration rate of the conveyor,

said deceleration servo loop providing a current reference signal for said current loop responsive to said first and second signals,

said current loop controlling the current in said brake coil.

4,600,866

MOTOR REVOLUTION SPEED CONTROL DEVICE

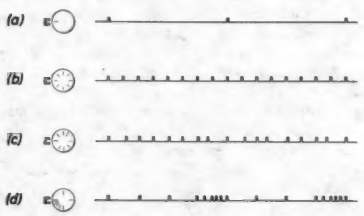
Kaoru Seto, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 501,030, Jun. 6, 1983, abandoned. This application May 17, 1985, Ser. No. 721,318

Claims priority, application Japan, Jun. 9, 1982, 57-97566

Int. Cl.⁴ H02P *5/00*

U.S. Cl. 318—313 **14 Claims**



1. A motor revolution speed control apparatus comprising:

a motor;

means for generating 1st through Nth signals each comprising a sequence of pulses spaced according to a predetermined revolution of said motor; said pulses of said first signal being irregular due to interval errors with respect to the pulses in each of the other signals;

means for setting a time period corresponding to a revolution speed of said motor;

control means for controlling the revolution speed of said motor according to said setting means;

the control means being constructed and arranged to control the motor speed such that the time period between specific two pulses of each of said signals is substantially equal to the time period which corresponds to the revolution speed set by the setting means.

11. A motor revolution control apparatus comprising:

a motor;

detection means for detecting the revolution speed of said motor;

setting means for setting the revolution speed of said motor; and

control means for controlling the revolution speed of said motor in accordance with the outputs from said detection means so as to rotate said motor at the revolution speed set by said setting means,

said control means including means for changing a gain of said control means in accordance with the revolution speed set by said setting means independently of the load on the motor.

4,600,867

MOTOR SPEED CONTROLLING DEVICE

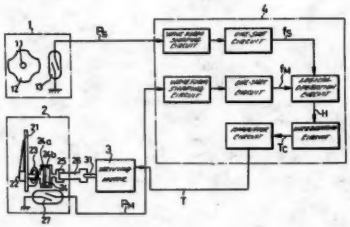
Ikuo Hayashi; Takaharu Idogaki, both of Okazaki, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 30, 1984, Ser. No. 666,608

Claims priority, application Japan, Nov. 1, 1983, 58-205433; Jun. 14, 1984, 59-122340; Jul. 3, 1984, 59-138220

Int. Cl.⁴ H02P *7/06*

U.S. Cl. 318—341 **13 Claims**



1. A motor speed controlling device wherein rotation speed of a motor is controlled and made coincident with a set speed, said controlling device comprising:

a set pulse signal generating means for generating a set pulse signal (f_S) having constant pulse width (T_1) and frequency (f_1) proportional to said set speed varying with the passage of time;

a rotation pulse signal generating means for detecting the rotation speed of said motor and generating a rotation pulse signal (f_M) having constant pulse width (T_2) and frequency (f_2) proportional to said rotation speed; and

a motor driving means for discriminating binary states of said set pulse signal (f_S) and said rotation pulse signal (f_M) to hold a driving signal (T) of said motor to a constant value if the binary states of both signals (f_S, f_M) are the same and increase said driving signal (T) of said motor at one definite gradient (τ_1) or decrease said driving signal (T) at another definite gradient (τ_2) if the binary states of both signals (f_S, f_M) are different.

4,600,868

OPEN LOOP ACCELERATION/DECELERATION CONTROL FOR DISK DRIVE STEPPER MOTORS

Lawrence M. Bryant, 1668 Flickinger Ave., San Jose, Calif. 95131

Filed May 9, 1983, Ser. No. 493,131

Int. Cl.⁴ G05B *19/10*

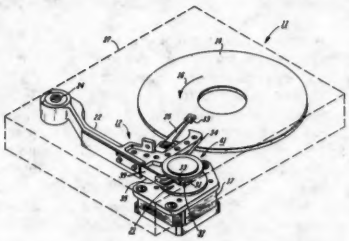
U.S. Cl. 318—567 **11 Claims**

1. In a disk drive having an actuator for aligning a read/write head with a selected data track, and a unipolar stepper motor for driving said actuator in response to seek commands identifying the direction and number of steps said actuator is to be moved to complete respective seeks;

the improvement comprising an open loop programmed controller for energizing and deenergizing selected phases

of said stepper motor in proper sequence to execute said seeks,

said controller being programmed to apply predetermined length bursts of width modulated complementary drive



voltage pulses to the phases of said motor which are energized and de-energized as said seek is being initiated and completed, whereby the acceleration and deceleration profiles of said actuator are controlled.

4,600,869

METHOD AND DEVICE FOR INPUTTING CO-ORDINATES FOR ROBOT

Yoshitada Sekine, Hoya, and Fumiki Yokota, Yamato, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

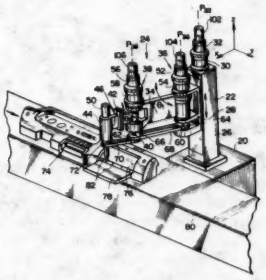
PCT No. PCT/JP83/00166, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04324, PCT Pub. Date Dec. 8, 1983

PCT Filed May 27, 1983, Ser. No. 584,940

Claims priority, application Japan, May 31, 1982, 57-091462

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—568 **16 Claims**



1. A method for inputting coordinate data for a robot comprising the steps of:

positioning a light-emitting means at a desired working position;

attaching an optical sensor means for detecting said light-emitting means in said working position to a work end of said robot;

displacing a movable segment of said robot including said optical sensor means to a predetermined orientation within a predetermined area, said area including said working position, and subsequently moving said optical sensor means with said movable segment of said robot in a predetermined pattern within said predetermined area so that said optical sensor means scans said predetermined area so as to detect the horizontal position of said light emitting means;

continually detecting the position of said optical sensor means;

deriving coordinates in the robot coordinate system of the position of said optical sensor means when said optical sensor means detects said light-emitting means; and

storing the derived coordinates in the robot coordinate system as working position indicative data in a memory means.

4,600,870

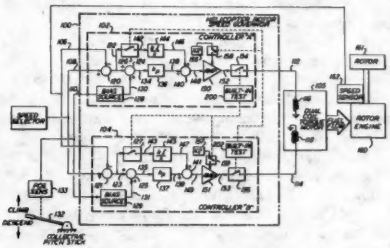
DUAL CONTROLLER POSITION CONTROL SYSTEM

Anthony N. Martin, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 17, 1983, Ser. No. 552,898

Int. Cl.[4] G05B *11/42*

U.S. Cl. 318—610 **10 Claims**



1. Apparatus, responsive to a parameter actual value signal and a parameter reference value signal, for providing a position control signal for controlling the position of a controlled device in regulating the value of the parameter, comprising:

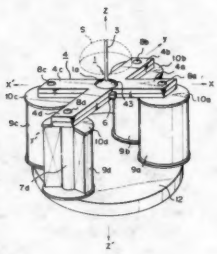
dual controller means, each having summing means responsive to the parameter actual value signal and to the parameter reference value signal for providing a difference signal value therebetween, each of said controller means further including proportional gain function apparatus and proportional plus integral gain function apparatus, said controller means each operating, alternatively, in either a first selected mode for multiplying said difference signal value by said proportional plus integral gain function to provide a proportional plus integral position control signal, or a second selected mode for multiplying said difference signal value by said proportional gain function to provide a proportional position control signal, one of said controller means being selected for operation in said first selected mode at all times, the other one of said controller means operating in said second selected mode in the presence of said one of said controller means operating in said first mode and in said first selected mode at all other times, said controller means each providing said proportional plus integral position control signal and said proportional position control signal at a signal output of each; and

coupling means, responsive to said proportional plus integral and said proportional position control signals from each of said controller means, for combining both to provide the position control signal to the controlled device.

4,600,871
MULTI-DIRECTIONAL DRIVE TYPE ELECTROMAGNETIC POSITION CONTROL APPARATUS

Takaharu Idogaki; Ikuo Hayashi, both of Okazaki, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 28, 1985, Ser. No. 706,861
Claims priority, application Japan, Mar. 2, 1984, 59-38818
Int. Cl.[4] G05B *1/06*
U.S. Cl. 318—653 **13 Claims**



1. A multi-directional drive type electromagnetic position control apparatus comprising:

a rotary sphere containing a permanent magnet;

a cross-shaped yoke made of a ferromagnetic substance;

support means for supporting the rotary sphere in a rotatable state at the crossing portion of the cross-shaped yoke; and

magnetic field generating means for generating a magnetic field at the crossing portion of the cross-shaped yoke;

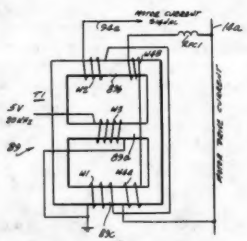
the rotational position of said rotary sphere being controlled to a position where the torque resulting from the combination of a stabilization force due to the permanent magnet in said rotary sphere and a force exerted on the rotary sphere due to the magnetic field generated by the magnetic field generating means is zero;

said rotary sphere being stabilized at a predetermined rotational position by receiving the stabilization force even when no magnetic field is generated by the magnetic field generating means.

4,600,872
APPARATUS FOR VARIABLE SPEED DRIVE OF AN INDUCTION MOTOR FROM A FIXED FREQUENCY AC SOURCE

Francis H. Shepard, Jr., 16 Lee Lane Countryside, Summit, N.J. 07901

Division of Ser. No. 395,331, Jul. 6, 1982. This application Mar. 20, 1985, Ser. No. 713,762
Int. Cl.[4] G05B *1/06*; G05F *1/325*
U.S. Cl. 318—658 **3 Claims**



1. Apparatus for sensing current comprising:

a magnetically saturable core having a center leg and first and second outer legs;

a first winding on said first outer leg;

a second winding on said second outer leg;

said first and second windings being connected in series and wound opposed to provide balanced equal and opposite outputs;

an excitation winding on said center leg;

said excitation winding being effective for driving said first and second outer legs substantially simultaneously to magnetic saturation, the opposed windings of said first and second windings cancelling output therefrom;

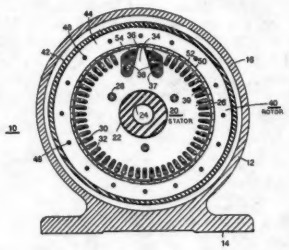
means for coupling at least a sample of said current to be sensed to third and fourth windings on said first and second outer legs, said sample being effective to induce a magnetic flux in said first and second outer legs, said magnetic flux making unequal the times at which said first and second outer legs reach magnetic saturation in response to said excitation winding; and

said first and second windings being effective, during a time when one of said first and second outer legs is magnetically saturated and the other is not, to produce an output pulse.

4,600,873
SYNCHRONOUS A.C. MOTOR

John F. Roesel, Jr., and Ronnie J. Barber, both of Bradenton, Fla., assignors to Precise Power Corporation, Bradenton, Fla.

Filed Dec. 10, 1984, Ser. No. 679,834
Int. Cl.[4] H02P *5/28*
U.S. Cl. 318—701 **15 Claims**



1. A synchronous A.C. electrical motor comprising (A) a stator, bearings associated with the stator for supporting a rotor, the stator comprising a body of high permeability soft magnetic material arranged to have low eddy current losses, the body having a surface in the shape of a surface of revolution coaxial with the axis of the rotor, power windings energizable with input A.C. power disposed in the body adjacent to the surface of revolution to provide a rotating magnetic field about the axis when so energized, an excitation coil energizable with single phase A.C. disposed about a pole piece having a magnetizing face substantially at the surface of revolution, and (B) the rotor having three electrically and magnetically associated major components comprising (1) a first external layer of a high coercive force, low electrical conductivity magnetizable permanent magnetic material, the first layer having an exterior surface of revolution coextensive with and complementarily matching the surface of revolution of the stator with a rotational clearance space therebetween, (2) a second component upon which the first layer is placed in close contact to provide a low reluctance path for magnetic flux from the first layer, the second component comprising a body of high permeability material arranged to provide low eddy current losses therein, and (3) the third component closely physically associated with the second component and being spaced radially on the other side of the second component from the side on which the first layer is placed, the third component comprising a ferromagnetic material having high permeability and high

electrical conductivity, and also having a selected high electrical resistance to the flow of transverse electrical currents, whereby during starting and at low rotor speeds the rotating magnetic field of the stator will generate transverse circulating electrical currents in the third ferromagnetic component that will react with the rotating magnetic field so as to apply a rotational torque to the rotor, and the selected high electrical resistance in the transverse direction in the third component providing for the inducing of relatively low amperage transverse currents in the component, and at higher speeds approaching synchronous speed, when the excitation coil is energized with A.C., the pole piece will be magnetized into successive strong north and south polarity and its magnetizing face will magnetize the first layer of permanent magnetic material into a controlled pattern of north and south magnetic poles that are at such a phase angle relative to the rotating magnetic field of the stator so as to produce a strong rotational torque capable of bringing the rotor up to synchronous speed.

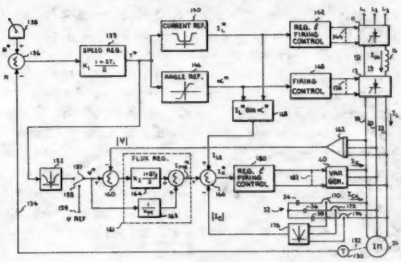
4,600,874

EXCITATION CURRENT CONTROL FOR INDUCTION MOTOR DRIVE USING LOAD COMMUTATED INVERTER CIRCUIT

Leland C. Tupper, Schenectady, N.Y.; Loren H. Walker; Herbert W. Weiss, both of Salem, Va., and James W. Sember, Roanoke, Va., assignors to General Electric Company, Salem, Va.

Filed Feb. 26, 1985, Ser. No. 705,962
Int. Cl.[4] H02P *5/40*; H02J *3/18*
U.S. Cl. 318—798 **27 Claims**

MICROFICHE APPENDIX INCLUDED
(11 Microfiche, 651 Pages)



1. A system for controlling the operation of an alternating current induction motor having windings furnished with electrical excitation from a polyphase alternating current power source comprising:

(a) a controllable load commutated inverter circuit, including a controllable source side alternating current to direct current converter and a load side direct current to alternating current converter interconnected by a direct current link, connected between said power source and said induction motor, said load commutated inverter circuit having an output furnishing an output current having real and demagnetizing polarity exciting current components to said motor;

(b) a capacitor circuit connected to the motor windings and to the output of said load commutated inverter circuit for furnishing leading exciting current to said motor and said load commutated inverter circuit;

(c) a controllable VAR generator connected to the motor windings and to the output of said load commutated inverter circuit for furnishing exciting current to said motor and said load commutated inverter circuit;

(d) means to generate a motor operation command signal;

(e) a first control path including means responsive to said motor operation command signal for controlling the operation of said alternating current to direct current converter;

(f) a second control path responsive to said motor operation command signal for controlling the operation of said direct current to alternating current converter;

(g) a third control path for controlling the exciting current furnished to said motor by said VAR generator, said third control path including,

(1) means to generate an exciting current command signal proportional to the amount of exciting current required for a desired motor operation; and,

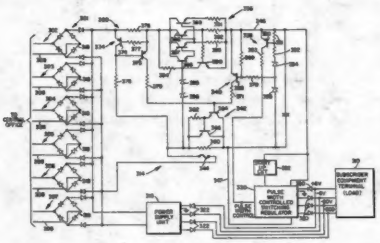
(2) means responsive to said exciting current command signal to control said VAR generator.

4,600,875

POWER SUPPLIES WITH LATCH-UP PREVENTION AND AUTOMATIC BACK-UP

Donald W. Wortman, Central Islip, N.Y., assignor to TII Corporation, Copiague, N.Y.

Division of Ser. No. 234,725, Feb. 17, 1981, Pat. No. 4,392,225.
This application May 10, 1983, Ser. No. 493,349
Int. Cl.[4] G05F *5/00*; H02J *7/00*
U.S. Cl. 323—303 **8 Claims**



1. A d.c. power supply comprising a pair of terminals adapted to be connected to a d.c. source, means for converting the power supplied from said source to d.c. power of a lower voltage, a pulse width controlled switching regulator connected across said terminals for so converting the power supplied by said source into serially occurring pulses of variable width as to maintain constant switching regulator input power, said switching regulator having a pulse width controlling input to provide for the control of the widths of said pulses, and voltage sensing means connected intermediate one of said terminals and said pulse width control input and providing power to said input as long as the d.c. line voltage across said terminals remains above a pre-selected value, said voltage sensing means being independent of the voltage to which the power supplied from said d.c. power source is converted but responsive to a drop in said line voltage below said preselected value to completely remove the power from said input, and said switching regulator being responsive to the removal of power from said input to reduce the widths of said pulses and thereby limit the current drawn by said switching regulator, consequently reducing losses in the power available to the load supplied by said switching regulator while increasing the input voltage to said regulator to maintain the power available to the load at an established level.

4,600,876

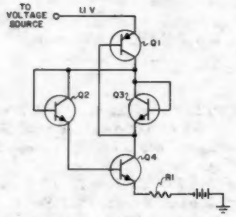
INTEGRATED BOOTSTRAP BIAS CIRCUIT

Eduard F. B. Boeckmann, Huntsville, Ala., assignor to GTE Communication Systems Corp., Northlake, Ill.

Filed Sep. 23, 1985, Ser. No. 779,003
Int. Cl.[4] G05F *3/22*
U.S. Cl. 323—311 **8 Claims**

1. A voltage dropping circuit useful in providing low level bias current comprising:

a voltage source;
first, second, third and fourth transistors each including base, emitter and collector electrodes;
said first transistor emitter connected to said voltage source;
the collector and base of both said second and said third transistor connected to the collector of said first transistor;
the base of said first transistor connected to said third transistor emitter in common with said fourth transistor collector;



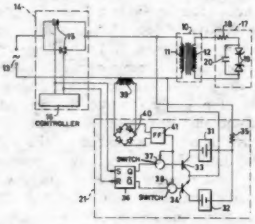
said second transistor emitter connected to said fourth transistor base;
output means; and
resistance means connected between said fourth transistor emitter and said output means;
whereby said circuit operates to drop the voltage of said source at said output a predetermined amount.

4,600,877

ARRANGEMENT IN TRANSFORMERS

Rolf Söderholm, Gothenburg, Sweden, assignor to Kraftelektronik AB, Surte, Sweden

Filed Sep. 19, 1984, Ser. No. 651,943
Claims priority, application Sweden, Sep. 22, 1983, 8305137
Int. Cl.[4] H02J *3/00*
U.S. Cl. 323—324 **5 Claims**



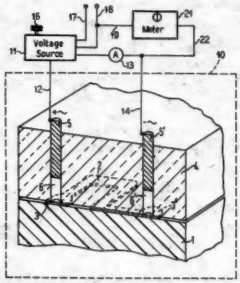
1. An arrangement for a transformer having a primary winding which is connectable to an a.c. voltage source via a switch means which opens and closes at a controllable frequency in a manner such that said switch means is closed during at least parts of predetermined half-periods of the a.c. voltage separated by a predetermined even number of half-periods of said a.c. voltage, wherein connected in parallel with the primary or secondary winding of the transformer is a circuit which substantially maintains the magnetization of the transformer caused by the previous closing of the switch means.

4,600,878

APPARATUS FOR TESTING ELECTRICAL MICROPRINTED CIRCUITS UTILIZING IONIZING GAS FOR PROVIDING ELECTRICAL CONNECTIONS

Guenter Doemens, Holzkirchen, and Peter Mengel, Eichenau, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,233
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1982, 3231598
Int. Cl.[4] G01R *31/02, 15/12*
U.S. Cl. 324—51 **3 Claims**



1. A testing device for testing circuit paths on a printed circuit comprising a plate of insulation formed with a plurality of openings which are aligned with the ends of the circuit paths on said printed circuit, a plurality of electrodes with an electrode partially extending into each one of said plurality of openings, a direct-current voltage source connected to pairs of said plurality of electrodes such that a direct-current voltage can be applied to opposite ends of a circuit path on said printed circuit, means for applying an alternating-current voltage to said electrodes such that an alternating-current voltage can be superimposed on said direct-current voltage, an ionizing gas within said plurality of openings between the electrodes and the ends of the circuit paths, and means for measuring the alternating-current flow due to the applied alternating-current voltage between pairs of said electrodes which are connected to opposite ends of said circuit paths.

4,600,879

WATER MOISTURE MEASURING INSTRUMENT AND METHOD

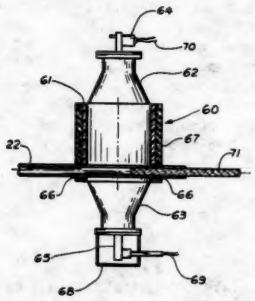
John P. Scully, 3071 Wakefield Dr., Carpentersville, Ill. 60110, and Richard Ward, 1931 Prairie Sq., Schaumburg, Ill. 60195

Filed Jun. 15, 1984, Ser. No. 620,848
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—58.5 A **11 Claims**

1. A water moisture measuring instrument wherein the microwave energy absorbed by the water moisture from a sample is monitored by detection of microwave energy comprising:
a source of gas having a pre-established dryness at a preset pressure and being conveyed and supplied in a conduit,
a means for driving volatiles from a polymer sample connected to said conduit supply and arranged with a further conduit for thereafter transmitting said volatiles and gas from said means for driving,
a microwave transducer cell being a non-metallic enclosure having a microwave oscillator and detector positioned across from and in alignment with one another and having said further conduit passing therebetween and in a predetermined position relative to the microwave beam between said oscillator and detector,
a microwave absorber material surrounding said transducer

cell to prevent scattered and reflected microwaves from passing to said detector,

a moisture absorber adjustably positioned axially along and within said further conduit for controlling the pressure



and flow of said volatiles and gas within said microwave beam, and

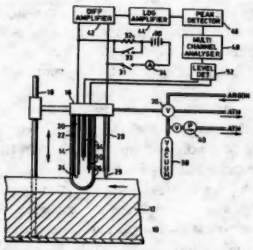
electronic circuitry connected to said oscillator and detector to register output of said detector as a consequence of water moisture in said moisture absorber.

4,600,880

APPARATUS FOR THE DETECTION AND MEASUREMENT OF PARTICULATES IN MOLTEN METAL

Don A. Doutre, Jonquiere, and Roderick I. L. Guthrie, Westmount, both of Canada, assignors to Limca Research Inc., Montreal, Canada

Division of Ser. No. 471,908, Mar. 3, 1983, Pat. No. 4,555,662. This application May 6, 1985, Ser. No. 730,911
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—71.1 **12 Claims**



1. Apparatus for the detection and measurement in a molten metal sample of suspended particulates of greater than a predetermined size whose electrical conductivites differ from that of the suspending molten metal in a molten metal sample comprising:

electrically insulating wall means providing a passage of predetermined size therethrough,

a pair of electrodes disposed on opposite sides of the wall means to establish a current path between them through the molten metal of the sample and passing through the said passage,

means for passing a sample of molten metal through the passage,

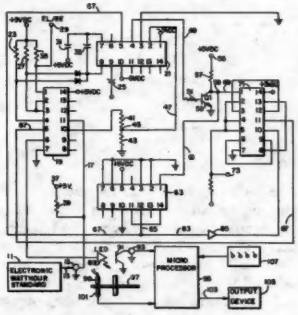
means for passing a test electric current of from 1 to 500 amperes between the two electrodes through the molten metal in the said current path at least while the molten metal sample is passing through the passage, and means connected to the two electrodes for detecting a change of voltage in the path resulting from the passage through the passage of the said particulates.

4,600,881

WATTHOUR TEST CIRCUITRY

Angelo A. La Rocca, and Anthony M. Osmanski, both of Hazelton, Pa., assignors to Pennsylvania Power and Light Company, Allentown, Pa.

Filed Apr. 6, 1983, Ser. No. 482,569
Int. Cl.[4] G01R *35/04*
U.S. Cl. 324—74 **16 Claims**



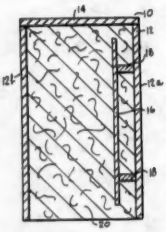
1. A circuit for providing accurately generated electrical pulses to electronic data processing means adapted to compare the electrical pulses with a predetermined reference to provide error in calibration of an energy meter comprising: a source of first pulses which provides electrical pulses at K pulses per second; a phase lock loop voltage controlled oscillator which is formed to generate pulses at N times K pulses per second to increase the frequency of the pulses from the source and which phase lock loop voltage controlled oscillator has a least first and second input means and at least one output means; first circuitry means connecting said source of first pulses to said first input means of said phase lock loop voltage controlled oscillator; counter circuitry having at least one input means and at least one output means, said counter circuitry formed to provide an output pulse on said output means in response to every P number of pulses received by said input means thereof; second circuitry means connecting said output means of said phase lock loop voltage controlled oscillator to said input means of said counter circuitry so that pulses from the output means of the oscillator are transmitted to the input means of the counter circuitry at the rate of NK pulses per second and in response the counter circuitry produces pulses at its output means at the rate of NK/P pulses per second; third circuitry means connecting said output means of said counter circuitry to said second input means of said voltage controlled oscillator to phase correct said voltage controlled oscillator in response to pulses supplied from said output means of said counter circuitry; logic circuitry means having a first input means coupled to said second circuitry means to receive pulses from the oscillator, a second input means coupled to said output means of said counter circuitry to receive pulses from the counter circuitry, a control signal input means, and at least one output means coupled with the electronic data processing means, said logic circuitry means formed to provide a first output of N times K pulses per second from the pulses received from the oscillator and a second output of NK/P pulses per second from the pulses received from the counter circuitry, alternatively, at said output means of said logic circuitry means in response to control input signals supplied to said control signal input means so that the alternative first and second outputs of the logic circuitry means may be alternatively transmitted to the electronic data processing means.

4,600,882

SENSITIVITY RECALIBRATION SYSTEM FOR BODY SEARCH METAL DETECTORS

Walker C. Cottrell, Jr., 308 Hillwood Rd., Richmond, Va. 23226

Filed Jul. 19, 1985, Ser. No. 757,017
Int. Cl.[4] G01R 35/00
U.S. Cl. 324—202 10 Claims



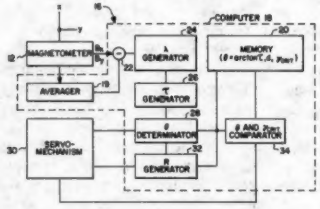
1. A device for use with hand held electronic detector of metal of adjustable sensitivity setting to conform the setting to an estabished standard of sensitivity for body search security purposes, comprising a generally cylindrical outer case of material substantially unaffected by magnetic and inductive fields, and a body of metal elongated in a direction parallel to the cylindrical axis of the case, said body being mounted within the case in spaced relation from the cylindrical axis and exterior side surface of the case and thus uniformly closer along its length to one side of the case than to the opposite side of the case, the metal body being capable of causing a hand held electronic metal detector to generate a predetermined signal when the detector is held close to the side of the case where the metal body is closest, and of not causing such signal when the detector is held close to said opposite side of the case.

4,600,883

APPARATUS AND METHOD FOR DETERMINING THE RANGE AND BEARING IN A PLANE OF AN OBJECT CHARACTERIZED BY AN ELECTRIC OR MAGNETIC DIPOLE

Werner H. Egli, Minneapolis, and James E. Lenz, Brooklyn Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 21, 1983, Ser. No. 534,448
Int. Cl.[4] G01R 33/02; G06G 7/78; G01B 7/14; G05F 1/00
U.S. Cl. 324—207 8 Claims



1. A method of determining with a device for measuring magnetic field perturbations the bearing θ in a plane of a ferromagnetic material located in a region subject to an external magnetic field of known strength and direction within said region, where θ is the angle between a line from said measuring device to the location of said ferromagnetic material and a first direction, said first direction being the direction of said external magnetic field in said plane at the location of said ferromagnetic material, comprising:

determining a first component in said plane of the perturbation of said external magnetic field at the site of said measuring device along said first direction;

determining a second component in said plane of the perturbation of said external magnetic field at the site of said measuring device along a second direction in. said plane, wherein said second direction is orthogonal to said first direction;

forming a first equation by setting said first component proportional to $(3\cos^2\theta - 1)$;

forming a second equation by setting said second component proportional to $(3\sin\theta\cos\theta)$;

forming a ratio of said first and second equations thereby yielding a third equation; and

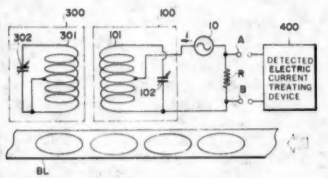
utilizing said third equation to determine θ.

4,600,884

APPARATUS FOR DETERMINING THE CONTINUITY OF HOLES FORMED IN A CONDUCTIVE SHEET

Akio Hara, Tokyo, Japan, assignor to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 416,091
Claims priority, application Japan, Sep. 8, 1981, 56-141221
Int. Cl.[4] G01N 27/12; G01R 33/12; G08B 21/00
U.S. Cl. 324—236 5 Claims



1. A press punching defect detecting device, comprising:

an electromagnetic sensor disposed at a passing position of a blank after a product is punched by a press for detecting electromagnetically the condition of an electric path formed by the circumference of a punched hole of the blank;

an auxiliary sensor for detecting electromagnetically the condition c ˜ an adjacent electric path formed by the circumference of a punched hole adjacent to the circumference of a punched hole which said electromagnetic sensor monitors and for causing said electromagnetic sensor to output a signal representing that said electric path is an open loop when said electric path becomes a closed loop by the combination of the circumferences of the adjacent punched hole;

a discriminating circuit for discriminating as to whether or not said electric path forms a closed loop on the basis of the output of the electromagnetic sensor,

whereby the quality of the product punched by the press is discriminated;

said electromagnetic sensor comprises a parallel resonance circuit, and an oscillator for providing an a-c current to said resonance circuit and a resistance for picking up current change flowing in the resonance circuit, and said auxiliary sensor is a parallel resonance circuit including an inductance which is coupled with the inductance of the resonance circuit of said electromagnetic sensor by a predetermined mutual inductance; and

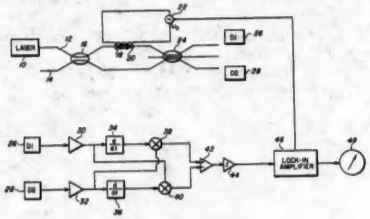
said parallel resonance circuits have mutually identical resonating condition, and a predetermined electric power is supplied only to the resonance circuit in said electromagnetic sensor.

4,600,885

FIBER OPTIC MAGNETOMETER FOR DETECTING DC MAGNETIC FIELDS

Kee P. Koo; Anthony Dandridge, both of Alexandria, Va.; Alan B. Tveten, Fort Washington, Md., and George H. Sigel, Jr., Great Falls, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1984, Ser. No. 610,463
Int. Cl.[4] G01R *33/02*
U.S. Cl. 324—244 **8 Claims**



1. A fiber optic magnetometer for detecting DC magnetic fields comprising:

a length of optical fiber having an optical length L in an unstrained condition;

magnetostrictive means closely associated with said fiber such that said magnetostrictive means undergoes a dimensional change in the presence of a magnetic field so as to strain said fiber and change the optical length of said fiber, the change in optical length being denoted as ΔL;

an AC field generating means for generating an AC magnetic field having a frequency ω_0 in the vicinity of said magnetostrictive means so as to cause dimensional changes in said magnetostrictive means, said AC field generating means being nonvariable with respect to the amplitude of the AC field generated thereby, whereby said AC magnetic field generating means causes a time varying ΔL having several frequency components, one of the components being an ω_0 component which has an amplitude;

detection means for detecting the ω_0 component, the amplitude of the ω_0 component being proportional to the magnitude of a DC magnetic field to which said magnetostrictive means is exposed.

4,600,886

APPARATUS FOR ORIENTING A MAGNETOMETER

Homer Jensen, Elkins Park, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed Mar. 11, 1983, Ser. No. 474,682
Int. Cl.[4] G01R *33/08*
U.S. Cl. 324—301 **12 Claims**

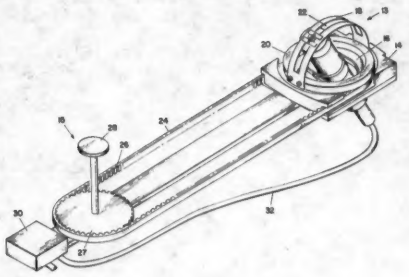
7. Apparatus for positioning an optical magnetometer comprising, in combination:

(a) a planar platform having an aperture;

(b) means for engaging a magnetometer to said platform, said means including (i) an inner ring for securing a magnetometer and (ii) an outer ring, said outer ring being pivotally engaged to said platform to define a tilting axis of rotation in the plane of said platform and being pivotally engaged to said inner ring to define another axis of tilting rotation orthogonal to said last-named axis;

(c) a guide for restraining one end of a magnetometer to set it at a preselected tilt angle; and

(d) means located in the plane of said platform for rotating said guide whereby the optical axis of a magnetometer is constrained to lie in the magnetic meridional plane so that one element of the cone of optimum detection of the



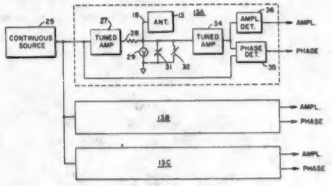
magnetometer is always coincident with the magnetic field vector.

4,600,887

MICROWAVE ELECTROMAGNETIC BOREHOLE DIPMETER

Willett F. Baldwin, Dallas, and Liang C. Shen, Houston, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 18, 1984, Ser. No. 601,464
Int. Cl.[4] G01V *3/30*
U.S. Cl. 324—333 **2 Claims**



1. A method of microwave electromagnetic logging to determine the dip of subsurface earth formations surrounding a borehole, comprising the steps of:

(a) advancing a borehole logging tool through a borehole, said logging tool including a source of microwave energy and at least three microwave antennas positioned from the longitudinal axis of said tool and spaced approximately equally around said axis,

(b) applying microwave energy to said antennas for irradiating the formations surrounding the borehole as the logging tool is moved through the borehole,

(c) measuring the loading effect of formation impedance on said at least three antennas and producing at least three signals proportional thereto,

(d) measuring the complex impedance imposed on said at least three antennas and producing signals representing both the real and imaginary components of said complex impedance,

(e) utilizing said measured loading effects in the determination of the dip of the formations surrounding the borehole in the absence of interfering mud-cake conductivity along the borehole wall, and

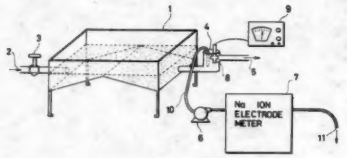
(f) utilizing the real component of said measured complex impedance to determine the dip of the formations surrounding the borehole at those points along the borehole where the presence of mud-cake conductivity interferes with the determination of formation dip from said measurements of the loading effects of the formation impedance on said antennas.

4,600,888

DEVICE FOR CONTINUOUSLY MONITORING THE DENSITY OF ATMOSPHERIC SODIUM IONS

Takaaki Fukumoto; Masaharu Hama, and Shinpei Kayano, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1984, Ser. No. 587,788
Claims priority, application Japan, May 20, 1983, 58-89522
Int. Cl.[4] G01N 27/08, 27/28
U.S. Cl. 324—439 4 Claims



1. A device for continuously monitoring the density of airborne sodium ions, comprising:

a water tank having a predetermined volume and having a top opened to the atmosphere;

water supplying and discharging means for continuously supplying pure water having a resistivity of at least 15 MΩ-cm to said water tank at a predetermined flow rate and for continuously discharging said pure water from said water tank at said predetermined flow rate so that the level of said pure water in said water tank is maintained unchanged; and

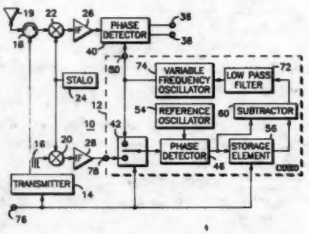
means for measuring the density of sodium ions in said pure water by continuously measuring a conductivity or resistivity of said pure water, said measuring means being arranged in a water discharging pipe coupled to said supplying and discharging means.

4,600,889

COHERENT OSCILLATOR

Thomas W. Rugen, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 13, 1985, Ser. No. 711,140
Int. Cl.[4] H03D 3/18
U.S. Cl. 329—50 20 Claims



1. A coherent oscillator circuit for regenerating the phase and frequency of a master signal in a coherent oscillator output signal, said circuit comprising:

a switch having a first signal input adapted to receive the master signal, a second signal input, and an output;

a reference oscillator having an output for providing a reference signal;

a phase detector having a first input coupled to the output of said switch, a second input coupled to the output of said reference oscillator, and an output;

a storage element having a signal input coupled to the output of said phase detector and an output for providing a sampled phase signal;

a subtractor having a first input coupled to the output of said phase detector, a second input coupled to the output of said storage element, and having an output; and

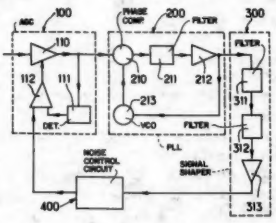
a variable frequency oscillator having a control input coupled to the output of said subtractor and an output coupled to the second signal input of said switch, the output of said variable frequency oscillator being for supplying the coherent oscillator output signal.

4,600,890

DEMODULATOR COMPRISING A PHASE-LOCKED LOOP

Philippe Horvat, Saint-Pierre-du-Vauvray, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1985, Ser. No. 693,916
Claims priority, application France, Jan. 25, 1984, 84 01127
Int. Cl.[4] H03D 3/02
U.S. Cl. 329—122 5 Claims



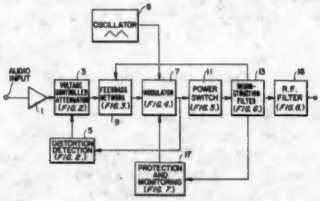
1. A phase or frequency demodulator comprising an automatic gain control circuit for producing from a non-controlled incoming carrier wave, a modulated signal of a constant average level, and a phase-locked loop for producing a demodulated signal from said modulated signal characterized in that said demodulator further comprises an automatic noise control circuit, arranged in a feedback path between said loop and said automatic gain control circuit, for producing an analog signal, an amplitude of which is proportional to the rate at which the loop is temporarily disabled.

4,600,891

DIGITAL AUDIO AMPLIFIER HAVING A HIGH POWER OUTPUT LEVEL AND LOW DISTORTION

Wilson E. Taylor, Jr., and Larry E. Hand, both of Meridian, Miss., assignors to Peavey Electronics Corporation, Meridian, Miss.

Filed Aug. 21, 1984, Ser. No. 643,315
Int. Cl.[4] H03F 3/38
U.S. Cl. 330—10 35 Claims



1. In a digital energy conversion high fidelity audio amplifier having an audio signal source for producting an audio frequency analog signal to be amplified, voltage controlled attenuation means, a modulator for converting said analog signals to pulse width modulated trains of pulses, power amplifier means for amplifying said pulse width modulated trains of pulses, and

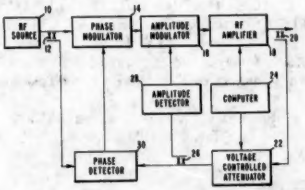
reconstruction filter means for recovering the analog signals from said width modulated trains of pulses:

comparator means within said modulator having a first and second input terminal for producing a pulse train, width modulated in accordance with the amplitude of said analog singal, means for coupling a serrated waveform pulse generator to the first input terminal of said comparator and having a given sampling frequency, together with means for coupling said audio signal to the second input terminal of said comparator, and wherein said comparator includes a first non-saturating differential amplifier, and a second non-saturating differential amplifier having input terminals thereof coupled to the output terminals of said first differentail amplifier.

4,600,892
RF AMPLIFIER WITH FREQUENCY SPECTRUM CONTROL

Gene A. Wagner, Torrance, and Irwin L. Newberg, Northridge, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 28, 1984, Ser. No. 626,098
Int. Cl.⁴ H03G *9/20*
U.S. Cl. 330—144 **4 Claims**



1. An RF amplifier arrangement for providing output signals having a controlled frequency distribution comprising:

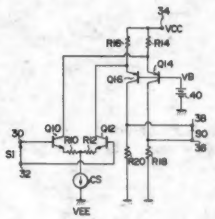
an RF amplifier; and

means for causing said RF amplifier to produce pulsed output signals and including input means for applying input signals to said RF amplifier including means for adjusting the amplitude and phase of the input signals as a function of the amplitude and phase respectively of the output signals from said RF amplifier and for also adjusting the amplitude of the input signals so as to cause the power across each of the output signal pulses to vary in accordance with a predetermined sequence whereby such amplitude control of the input signals results in a modified frequency distribution in the energy of the output signals, and wherein said input means includes a source of RF signals, a controllable power adjustment device coupled to receive a portion of the output power from said RF amplifier, computer means programmed to control the relative response to said power adjustment device in accordance with said predetermined sequence, and means coupled between the output of said RF signal source and the input of said RF amplifier for adjusting the phase and amplitude of the input signal to said RF amplifier as a function of the phase and amplitude, respectively, of the output signal from said power adjustment device.

4,600,893
DIFFERENTIAL AMPLIFIER WITH IMPROVED DYNAMIC RANGE

Yasuhiro Sugimoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Oct. 18, 1984, Ser. No. 662,097
Claims priority, application Japan, Oct. 24, 1983, 58-198689
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—252 **11 Claims**



1. A differential amplifier comprising:

first and second potential terminals between which a power source voltage is applied;

detecting means, including first and second transistors whose emitters are coupled to each other and further including a constant current source connected between said first potential terminal and the junction of the emitters of said first and second transistors, for detecting a voltage difference between first and second voltage signals supplied to the base of said first and second transistors, respectively;

amplifying means including third and fourth transistors which have a complementary relationship to said first and second transistors, and whose emitters are respectively connected to the collectors of said first and second transistors, said amplifying means also including a bias circuit for supplying bias voltages to the bases to said third and fourth transistors, and a load circuit connected between the collectors of said third and fourth transistors and said first potential terminal;

first connecting means coupling said second potential terminal with the emitter of said third transistor, for setting the potential at the emitter of said third transistor to a level corresponding to that of said second potential terminal; and

second connecting means coupling said second potential terminal with the emitter of said fourth transistor, for setting the potential at the emitter of said fourth transistor to a level corresponding to that of said second potential terminal.

4,600,894
PLANAR RADIAL RESONATOR OSCILLATOR/AMPLIFIER

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1984, Ser. No. 644,848
Int. Cl.⁴ H03F *3/60*
U.S. Cl. 330—287 **13 Claims**

1. A resonator oscillator/amplifier device comprising:

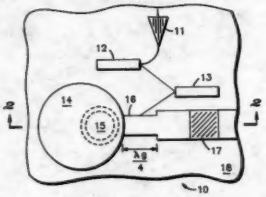
a planar substrate having opposed surfaces with a hole extending therebetween;

a radial disc having a center, said radial disc being mounted on one of the surfaces of said substrate and covering the hole through said substrate;

a negative impedance device having a center and being coupled to the hole of said substrate opposite said radial disc;

a conductor having a width that establishes the output coupling which determines an external quality coefficient

(Q_{ext}), said conductor being coupled to said radial disc; and



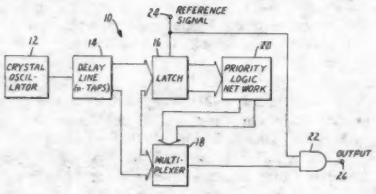
an input coupling coefficient dependent upon the relative position of the centers of the radial disk and the negative impedance device.

4,600,895

PRECISION PHASE SYNCHRONIZATION OF FREE-RUNNING OSCILLATOR OUTPUT SIGNAL TO REFERENCE SIGNAL

Stephen P. Landsman, Randallstown, Md., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 26, 1985, Ser. No. 727,422
Int. Cl.[4] H03L *7/00*; H04N *5/04*
U.S. Cl. 331—1 A **5 Claims**



1. A circuit for providing a synchronized output signal at a predetermined frequency which is synchronized with a selected transition of an input reference signal, comprising

(a) delay means coupled to receive an input signal oscillating at said predetermined frequency for generating a plurality of output signals at said predetermined frequency, each output signal being shifted in phase with respect to the input signal on a different fraction of the period of the input signal,

(b) means for selecting that output signal from the delay means having a transition at a time closest to the time of said selected transition of said reference signal, and

(c) means for outputting said selected output signal as said synchronized output signal.

4,600,896

CIRCUIT FOR LIMITING JITTER TRANSIENTS DURING SWITCHING OF PHASE CONTROL SIGNALS TO AN OSCILLATOR

Giuliano Cellerino, Milan, Italy, assignor to GTE Communication Systems Corporation, Northlake, Ill.

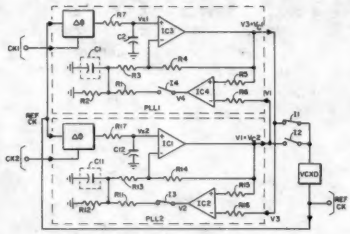
Filed Sep. 25, 1984, Ser. No. 654,337
Int. Cl.[4] H03L *7/10*
U.S. Cl. 331—11 **8 Claims**

1. An arrangement for limiting jitter transients during the interval of switching between a first and a second channel comprising:

a constant frequency oscillator including an output and a control input,

a first and a second phase detector each having an input connected to an associated incoming channel and another input connected to said oscillator output, including other means operative to detect phase differences between said inputs and developing a control voltage proportional thereto,

connect means for selectively impressing said control voltage from one of said first and second phase detectors onto said oscillator control input for accordingly changing the phase of said oscillator output signal, to conform with said



input phase differences, each said phase detector further including a control voltage storage means,

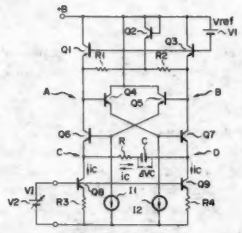
and other connect means operated to selectively impress said control voltage from said one of said first and second phase detectors to the storage means of the other one of said first and second phase detectors, whereby said other one of said phase detectors has available a control voltage to apply to said oscillator upon operation to an active state.

4,600,897

VOLTAGE-CONTROLLED OSCILLATOR OF EMITTER-COUPLED ASTABLE MULTIVIBRATOR TYPE

Takashi Koga, Fukaya, and Hisakazu Hitomi, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1984, Ser. No. 661,970
Int. Cl.[4] H03K *3/281*
U.S. Cl. 331—113 R **5 Claims**



1. A voltage-controlled oscillator of the emitter-coupled astable multivibrator type comprising:

a first transistor;

a second transistor;

a series circuit connected between the emitters of the first and second transistors and including at least a capacitor and an impedance element which exhibits an imaginary part for an operating frequency range of said voltage-controlled oscillator being negligible with respect to a real part, the real part consisting of a resistive value Ra which is so selected as to satisfy

$$Ra=(\tau d1+\tau d2)/2Ca$$

where Ca is the capacitance of said capacitor and ($\tau d1 + \tau d2$) is a delay time during one oscillation period of the voltage controlled oscillator;

first and second loads connected respectively to the collectors of said first and second transistors;

feedback means connected between the collector of said first transistor and the base of said second transistor, and connected between the collector of said second transistor and the base of said first transistor;

first and second current sources respectively connected to the emitters of said first and second transistors; and

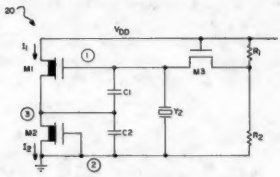
a control voltage source commonly connected to said first and second current sources.

4,600,898

ONE-PIN CRYSTAL OSCILLATOR

Joseph T. Santos, Sunnyvale, and Robert G. Meyer, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 26, 1984, Ser. No. 593,485
Int. Cl.[4] H03B 5/36
U.S. Cl. 331—116 FE **24 Claims**



1. An oscillator circuit comprising:

a crystal;

a first transistor forming an amplifier of the circuit;

a second transistor interconnected in series with the first transistor forming a current source of the circuit;

a high impedance voltage source biasing the gate of the first transistor with the source of the second transistor grounded;

said crystal connected between the gate of the first transistor and the ground; and

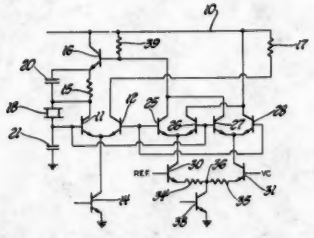
wherein said first and second transistors are depletion mode field-effect transistors.

4,600,899

DUAL MODE CRYSTAL PHASE SHIFT TRANSISTOR OSCILLATOR

Richard A. Kennedy, Russiaville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 11, 1985, Ser. No. 700,488
Int. Cl.[4] H03B 5/36
U.S. Cl. 331—116 R **5 Claims**



1. A phase shift oscillator comprising, in combination:

an amplifier having input and output;

a feedback from the output to the input of the amplifier, the feedback loop including a resonator, the amplifier and resonator together comprising an oscillator effective to oscillate at a predetermined frequency;

means coupled to the amplifier to generate a voltage oscillating at the same frequency as the combined amplifier and resonator, said generated voltage being selectively variable in amplitude from zero upward either in phase with the voltage at the output of the amplifier or one hundred eighty (180) degrees out of phase therewith;

means effective to shift the phase of the generated voltage from the last means ninety (90) degrees;

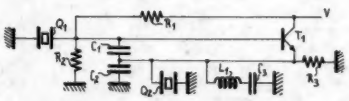
means effective to selectively combine the phase shifted generated voltage with the voltage at the output of the amplifier going into the resonator, whereby, when they are combined, the frequency of oscillation of the oscillator varies from the predetermined frequency in direction depending upon the phase of the generated voltage and in amount upon the amplitude of the generated voltage.

4,600,900

PIEZOELECTRIC OSCILLATOR HAVING FILTERS TO PREVENT UNWANTED MODES

Patrick Renoult, Paris, and Gérard Marotel, Sartrouville, both of France, assignors to Compagnie d'Electronique et de Piezo-Electricite, Argentuil, France

Filed Mar. 25, 1985, Ser. No. 715,833
Claims priority, application France, Mar. 27, 1984, 84 04747
Int. Cl.[4] H03B 5/36
U.S. Cl. 331—116 R **4 Claims**



1. A piezoelectric oscillator of the Clapp type for operation in the overtone mode in which provision is made for a first piezoelectric resonator having a resonance frequency at which the oscillator is designed to operate, said resonator being connected between the base of a transistor and ground, a capacitive voltage-dividing bridge being connected between the base of said transistor and ground and having a midpoint connected to the emitter of said transistor, the emitter of said transistor being loaded through a load resistor, comprising in parallel between said midpoint and ground on the one hand an inductance coil forming a high-pass filter with the capacitor of the capacitive bridge placed between the midpoint and ground, the function of said high-pass filter being to attenuate frequencies below said resonance frequency, and on the other hand a second piezoelectric resonator tuned to a frequency mode which is higher than said resonance frequency in order to eliminate said mode.

4,600,901

SWITCHED CAPACITANCE FEEDBACK CONTROL CIRCUIT AND SIGMA-DELTA MODULATOR USING SAME

Dirk H. L. C. Rabaey, Borgerhout, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

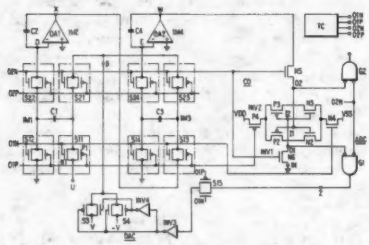
Filed Mar. 14, 1985, Ser. No. 711,704
Int. Cl.[4] H03K 7/00
U.S. Cl. 332—11 D **6 Claims**

1. A sigma-delta modulator for digitally encoding an analog input signal, comprising:

switched capacitance feedback control circuit means including a cascade connection of switched capacitance signal input means and signal processing means, said input means further including timing means for providing timing sig-

nals, a single capacitance means and switching means controlled by said timing means, such that said input means samples and algebraically adds an analog input signal and an analog feedback signal coupled thereto by said processing means;

and such that said processing means includes integration means for integrating said sampled and added input [x(t)] and feedback signals and to provide an analog output signal [w(t)];



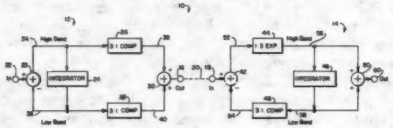
a one-bit analog-to-digital converter means providing a digital output signal (z) in response to said analog output signal, and a one-bit digital-to-analog converter means for providing said feedback signal in response to said output signal [w(t)], said input signal [x(t)] being sampled and wherein said converters being simultaneously operated by and during the first of said timing signals, and during the second of said timing signals said feedback signal is sampled and said input and feedback signals are added and integrated, and whereby said first and second timing signals are non-overlapping and define a sampling period.

4,600,902

COMPANDOR NOISE REDUCTION CIRCUIT

Stephen H. Lafferty, Norcross, Ga., assignor to Wegener Communications, Inc., Atlanta, Ga.

Filed Jul. 1, 1983, Ser. No. 510,010
Int. Cl.[4] H04B *1/64*
U.S. Cl. 333—14 **17 Claims**



1. A compandor for improving transmission of an analog signal on a transmission medium by overcoming noise in the transmission medium comprising:

a. composite compressor means having a compressor input for receiving the analog signal and a compressor output connected to the transmission medium, the composite compressor including:

i. compressor input summing circuit means and compressor frequency selective means connected in feedback relationship for dividing the analog signal into at least two uncompressed frequency components:

ii. integer compressor means connected to the compressor input summing circuit means and compressor frequency selective means for receiving each of the uncompressed frequency components of the analog signal and for compressing in parallel each uncompressed frequency component of the analog signal by an integer compression ratio to produce compressed frequency components of the analog signal; and

iii. compressor output summing circuit means connected to the integer compressor means for combining the compressed frequency components of the analog signal to produce a compressed analog signal at the output of the composite compressor means; and

b. composite expander means having an expander input connected to the transmission medium and an expander output, the composite expander including:

i. feedback loop for separating the compressed analog signal received from the transmission medium into compressed frequency components that correspond to the compressed frequency components of the analog signal found in the composite compressor and for deriving uncompressed frequency components that correspond to the uncompressed frequency components found in the composite compressor, the feedback loop comprising:

(a) expander input summing circuit means for receiving the compressed analog signal and extracting a first compressed frequency component from the compressed analog signal;

(b) integer expander means connected to the expander input summing circuit means for expanding the extracted first compressed frequency component by an integer expansion ratio to produce a first uncompressed frequency component of the anaalog signal;

(c) expander frequency selective means connected to the integer expander means for deriving from the first uncompressed frequency component the other uncompressed frequency components of the analog signal; and

(d) integer compressor means connected to the frequency selective means for compressing each of the other uncompressed frequency components to produce compressed frequency components which are connected via the feedback loop to the expander input summing circuit means and are used for extracting the extracted first compressed frequency component; and

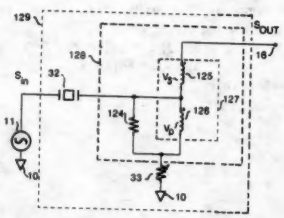
ii. expander output summing circuit means connected to the feedback loop for combining the uncompressed frequency components of the analog signal to reproduce the analog signal.

4,600,903

GAIN CONTROL COMPENSATION FOR BANDPASS FILTER WITH VARIABLE BANDWIDTH

Vladan Temer, 2141 Sunrise Ave., Santa Rosa, Calif. 95402

Filed Aug. 27, 1984, Ser. No. 644,741
Int. Cl.[4] H03H *7/03*
U.S. Cl. 333—177 **5 Claims**



1. A device, having an input and an output, for filtering an input signal, the device comprising:

passing means for receiving the input signal present at the device input and passing a frequency band within the input signal, the passing means having an input, an output and an impedence which includes a first resistance, the impedence being coupled between the input and the output, wherein the input signal at the device input is coupled

to the passing means input and a second signal appears at the passing means output;

first resistive means having a first end and a second end, the first end being coupled to the output of the passing means, for producing a voltage drop between the first end and the second end which is proportional to the voltage loss across the first resistance;

a transformer, having a primary coil and a secondary coil, the primary coil including a first coil end coupled to the first end of the first resistive means and a second coil end coupled to the second end of the first resistive means, the secondary coil including a first secondary coil end coupled to the first coil end of the primary coil and the secondary coil including a second secondary coil end coupled to the output of the device, wherein there appears across the first secondary coil end and the second secondary coil end a compensating voltage for compensating for the voltage loss across the first resistance; and

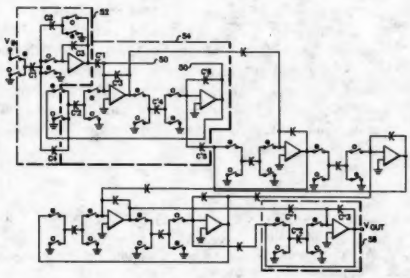
passband width varying means coupled to the second coil end of the primary coil of the transformer for varying the bandwidth of the frequency band passed by the passing means.

4,600,904

BROKEN LOOP SWITCHED CAPACITOR HIGH PASS FILTER

Wayne G. Shumaker, Westboro, Mass., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1984, Ser. No. 625,422
Int. Cl.[4] H03H *11/12*
U.S. Cl. 333—173 **2 Claims**



1. A switched capacitor high pass filter having an input and an output, comprising:

at least one high pass filter stage having at least two amplifiers, each amplifier having an input and an output port, said output port of a first amplifier coupled to said input port of a second amplifier via a first switched capacitor network and said output port of said second amplifier coupled to said input port of said first amplifier via a second switched capacitor network;

an active output stage having an input and an output port, said output port coupled to the output of the switched capacitor filter;

a first delay free coupling means from said output port of said first amplifier of said at least one high pass filter stage to said input port of said output stage, thereby creating a delay free coupling from said input port of said first amplifier to said output port of said output stage;

a second delay free coupling means from said output port of said output stage to said input port of said second amplifier of said at least one high pass filter stage; and

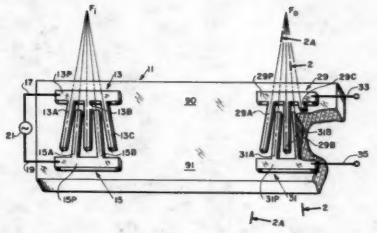
a switched capacitor inductor coupled between the input of the switched capacitor high pass filter and said input port of said first amplifier in a first one of said at least one high pass filter stage.

4,600,905

FLAT PASSBAND ETCHED GROOVE SAW FILTER

Hans P. Fredricksen, Burnsville, Minn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 3, 1985, Ser. No. 771,968
Int. Cl.[4] H03H *9/64, 9/145*
U.S. Cl. 333—196 **9 Claims**



1. A surface acoustic wave device comprising:

a piezoelectric substrate for propagating surface acoustic waves;

said substrate having first and second pluralities of electrode receiving grooves in the upper surface thereof and positioned generally transverse to the direction of propagation of said surface acoustic waves, said grooves having a depth which varies along the length thereof;

input transducer means at one end of said substrate having a pair of opposing transducer pads, each of said pads including a plurality of interdigitated electrode fingers, each of said fingers fitting within respective ones of said first plurality of electrode receiving grooves for exciting a surface acoustic wave upon said substrate in response to an electrical signal applied thereto; and

output transducer means at the other end of said substrate and having a second pair of opposing transducer pads, each of said second pads including a plurality of interdigitated electrode fingers, each of said fingers fitting closely within respective ones of said second plurality of electrode receiving grooves, respective fingers of said input and output transducers having a corresponding depth which varies along the length thereof, said output transducer means serving to convert said surface acoustic wave excited upon said substrate into an electrical signal having improved frequency response characteristics.

4,600,906

MAGNETICALLY TUNED RESONANT CIRCUIT WHEREIN MAGNETIC FIELD IS PROVIDED BY A BIASED CONDUCTOR ON THE CIRCUIT SUPPORT STRUCTURE

Ronald E. Blight, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 446,530, Dec. 3, 1982, abandoned. This application Jun. 3, 1985, Ser. No. 741,025
Int. Cl.[4] H01P *1/218, 7/00*
U.S. Cl. 333—205 **28 Claims**

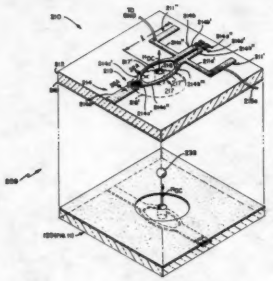
1. In combination:

a support structure;

means, including a pair of coupling circuits, each connected to one of an input port and an output port, said pair of coupling circuits being disposed on the support structure, and a gyromagnetic resonant body disposed adjacent said pair of coupling circuits, for coupling resonant frequency energy between said pair of coupling circuits, said coupling means further comprising:

means, including a conductor disposed on the support structure, for providing a magnetic field through the resonant

body in response to a signal fed to said conductor to control the coupling between the coupling circuits; and



means for isolating the signal fed to the conductor from the input and output ports.

4,600,907

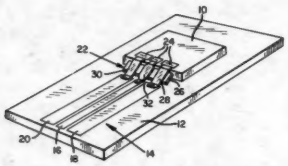
COPLANAR MICROSTRAP WAVEGUIDE INTERCONNECTOR AND METHOD OF INTERCONNECTION

H. Erwin Grellman, Beaverton; Carl W. Laakso, Portland; John J. Reagan, Beaverton, and Leonard A. Roland, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 7, 1985, Ser. No. 709,463

Int. Cl.[4] H01P *1/04*

U.S. Cl. 333—246 **10 Claims**



1. A high frequency electrical connector for interconnecting a pair of electrical devices comprising a plurality of substantially parallel coplanar metallic straps supported by a dielectric substrate including at least one signal-carrying strap and adjacent ground plane straps disposed one on either side of the signal-carrying strap so as to form spacings of a predetermined width between the signal-carrying strap and each of the ground plane straps, the ends of each of said straps extending beyond the edges of said dielectric substrate to provide contact points for interconnection between said electrical devices.

4,600,908

CIRCUIT BREAKER

Naoshi Uchida, and Kiyoshi Kandatsu, both of Saitama, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Dec. 31, 1984, Ser. No. 687,868

Claims priority, application Japan, Jan. 30, 1984, 59-11533[U]

Int. Cl.[4] H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—8 **3 Claims**

1. A circuit breaker including fixed contactors each having a pole, movable contactors, each having a pole adapted to couple with the corresponding pole of a respective one of the fixed contactors, a switch mechanism, a tripping device, an arc extinction device and a molded casing, wherein high-speed current-limiting breaking is performed upon occurrence of a short-circuit current, said circuit breaker comprising:

a common switch shaft coupled to said movable contactors such that opening/closing operations of said poles are simultaneously performed, a center one of said movable contactors comprising a master movable contactor;

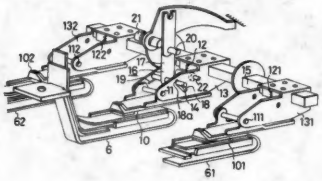
a holder for holding said master movable contactor;

a first shaft inserted into a modified eliptical hole formed in a side wall of said holder;

a link engaged with said first shaft and coupled to the switch mechanism, said first shaft connecting said link to said switch mechanism;

a second shaft for supporting said master movable contactor on said holder;

spring means for urging said first shaft to engage with an end portion of said respective modified elliptical hole; and



a rotary shaft coupled to said holder and arranged on a side opposite to said second shaft with respect to said link,

said link rotating in a first direction about said first shaft by an electromagnetic repulsion force generated by a short-circuit current between said master movable contactor and the fixed contactor disposed in opposition to said master movable contactor, said first shaft simultaneously disengaging from said end portion of said ellipitcal hole to move along a side of said elliptical hole and, at the same time, said holder rapidly rotating in a second direction about said rotary shaft opposite said first direction, thereby causing all the poles of said contactors to simultaneously perform their opening operations through said common switch shaft.

4,600,909

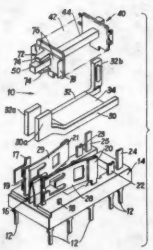
BIFURCATED CONTACT ARM IN A MINIATURE RELAY

James R. Willson, Ashland, Mass., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 20, 1985, Ser. No. 735,905

Int. Cl.[4] H01H *63/02, 67/02*

U.S. Cl. 335—133 **4 Claims**



1. A miniature electromagnetic relay of the type used in the telecommunications industry, comprising

a base of electrical insulating material,

a relay contact set having leads that electrically connect with respective terminals in said base,

said contact set having a pair of fixed contact leads that

carry respective normally open and normally closed stationary contacts,

said contact set also including a movable contact lead and a movable contact arm positioned between respective stationary contacts,

said movable contact arm having a mounting end attached to said movable contact lead and having two spaced, parallel, elongated contact carrying portions extending from said mounting and terminating in spaced ends that carry respective contacts,

an integral tab extending from the mounting end of said movable contact arm and between said spaced, parallel and elongated contact carrying portions of a contact arm, said tab being shorter in length than the elongated contact carrying portions of the movable contact arm,

magnetic pole means forming a magnetic gap at one end of said base,

an armature having one end in said magnetic gap,

means for producing an electromagnetic force for selectively moving said armature in said magnetic gap,

a pusher assembly mounted on said armature and arranged to engage the tab if said movable contact arm at a point of contact substantially perpendicular to the plane of said tab,

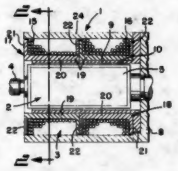
said armature being arranged to selectively move from one side of said magnetic gap to the opposite side depending upon the direction of said electromagnetic force, and the motion of said armature and said pusher assembly against said tab causing the contacts on the movable contact arm to selectively engage stationary contacts on said fixed contact leads.

4,600,910

LIMITED ANGLE TORQUE MOTOR WITH HIGH TORQUE OUTPUT MULTIPLE COILS AND INCREASED MAGNETIC CENTERING TORQUE

Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Dec. 21, 1984, Ser. No. 685,035
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—229 **16 Claims**



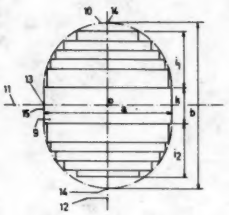
1. A limited angle torque motor comprising a rotor assembly and stator assembly, said rotor assembly including a rotor shaft mounted for rotation relative to said stator assembly and a permanent rotor magnet mounted for rotation with said rotor shaft, said permanent rotor magnet being diametrically oriented, and said stator assembly including a plurality of axially arranged stator coils, and a pair of separate stator pole pieces for each coil, said pole pieces of each pair being circumferentially spaced from each other, each said pole piece of each pair comprising a generally axially extending pole blade about which the respective stator coil circumferentially extends, and a radially outwardly extending flange portion at one end only of each said pole piece, said flange portions being at opposite ends of said pole pieces of each pair, whereby when said stator coils are energized by direct or pulse width modulated current, an electromagnetic torque is produced which causes said rotor shaft to rotate through a limited rotational angle range.

4,600,911

ELLIPTICALLY SHAPED MAGNETIC CORE

Heinz Meinert, Zemst, Belgium, assignor to Pauwels-Trafo Belgium N.V., Mechlin, Belgium

Filed Mar. 14, 1985, Ser. No. 711,817
Claims priority, application Belgium, Mar. 20, 1984, 60366
Int. Cl.[4] H01F *27/24*
U.S. Cl. 336—212 **5 Claims**



1. A magnetic core comprised of a stack of plates which extend mainly along a single axial direction and which contact one another with main surfaces, the cross-section having as envelope a closed curve without discontinuities comprised of

two halves from an ellipse spaced along a short axis with dimension a and

two straight lines which connect together end points of the half ellipses,

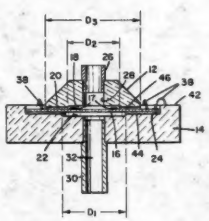
said closed curve thus having a first symmetry axis which lies in parallel relationship with the plates and a second symmetry axis at right angle thereto, whereby the spacing b between intersection points of the curve with the second symmetry axis is markedly wider than the spacing a between intersection points of the curve with the first symmetry axis.

4,600,912

DIAPHRAGM PRESSURE SENSOR WITH IMPROVED TENSILE LOADING CHARACTERISTICS

Eugene A. Marks, Riverside, and Arthur J. Peters, Norco, both of Calif., assignors to Bourns Instruments, Inc., Riverside, Calif.

Filed Jan. 25, 1985, Ser. No. 695,126
Int. Cl.[4] H01L *10/10*
U.S. Cl. 338—42 **18 Claims**



1. A pressure sensor of the type including a pressure-responsive diaphragm having a substantially uniform thickness and a central active area with strain-sensing elements thereon, said diaphragm being bonded on a first side to a first housing element and on a second side to a second housing element, said first and second housing elements including means for exposing said first and second diaphragm sides to first and second pressures, respectively, wherein the improvement comprises:

a first bonding layer between said first side of said diaphragm and said first housing element and surrounding said active area of said diaphragm; and

a second bonding layer between said second side of said

diaphragm and said second housing element and surrounding said active area of said diaphragm;

wherein each of said first and second bonding layers has an inside diameter, such that the inside diameter of said first bonding layer is greater than the inside diameter of said second bonding layer by a factor of at least approximately five times the thickness of said diaphragm.

4,600,913

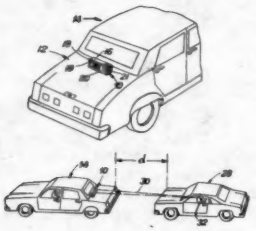
COLLISION AVOIDANCE DEVICE

Harold A. Caine, 484 Kent Ct., Oceanside, N.Y. 11572

Filed Dec. 24, 1984, Ser. No. 685,338

Int. Cl.[4] B60Q *1/26*

U.S. Cl. 340—104 **24 Claims**



20. A collision avoidance device for providing a visual indication to the driver of a trailing vehicle when the distance between his vehicle and a leading vehicle is safe, caution required, or hazardous, said device comprising a plurality of discrete circumscribed opaque spaces being of respective uniform width, only one opaque space being assigned to each corresponding distance between the vehicle, the widths of the opaque spaces increasing sequentially with respect to such distances, each opaque space separating at least two adjacent discrete circumscribed unpaired illuminated areas of any desired size unrelated to the distance between vehicles, whereby appearance of all the opaque spaces indicates a hazardous condition of distance between the vehicles, and the sequential disappearance of the opaque spaces as the adjacent illuminated areas merge indicates safer conditions of distances between the vehicles.

4,600,914

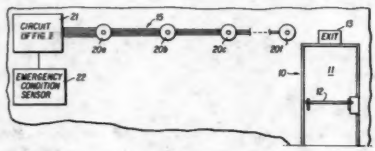
APPARATUS FOR DIRECTING ATTENTION TO SPECIFIC LOCATIONS SUCH AS EMERGENCY EXITS

James W. Walsh, 3823 Beech Ave., Baltimore, Md. 21211

Filed Feb. 10, 1983, Ser. No. 465,395

Int. Cl.[4] G08B *7/02, 25/00*

U.S. Cl. 340—286 R **9 Claims**



1. Apparatus for directing attention to a location, the apparatus comprising:

a plurality of sound generators each producing a sound having a pitch, the plurality of sound generators being arranged in an array wherein at least one sound generator is positioned at the location and another sound generator is positioned remote from the location;

activating means connected to the sound generators for individually activating the sound generators sequentially for a selected interval starting with the sound generator remote from the location and ending with the sound generator at the location; and

pitch increasing means connected to the sound generators for sequentially increasing the pitch of the sound emitted by each sound generator as the sound generators are activated by the activating means, wherein attention is directed toward the sound generator at the location by a pattern of sound created by the activating and pitch increasing means.

4,600,915

DIGITAL-TO-ANALOG CONVERTER CIRCUIT

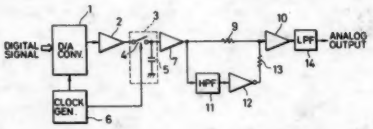
Masayuki Yoshida, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,904

Claims priority, application Japan, Mar. 7, 1984, 59-33421[U]

Int. Cl.[4] H03M *1/66*

U.S. Cl. 340—347 DA **3 Claims**



1. A digital-to-analog converter circuit comprising a digital-to-analog converter for converting into an analog audio signal within a range of effective signal frequencies lower than a first frequency; sample-and-hold means for sampling and holding an output signal of said digital-to-analog converter at a second frequency more than twice as high as said first frequency; means for phase inverting components in an output of said sample-and-hold means of a frequency higher than a third frequency between said first and second frequencies; and means for summing said output of said sample-and-hold means and an output of said inverting means.

4,600,916

PARALLEL ANALOG-TO-DIGITAL CONVERTER CIRCUIT

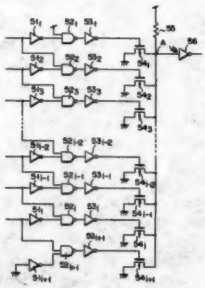
Eiji Masuda, Kawasaki; Kenji Matsuo, Yokohama, and Yasuhiko Fujita, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 21, 1983, Ser. No. 487,131

Claims priority, application Japan, Apr. 22, 1982, 57-67942

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 AD **1 Claim**



1. A parallel analog-to-digital converter circuit comprising: an n number of level comparator means for comparing the

level of an analog input signal with an n number of reference levels;

a first output means for outputting a digital signal corresponding to the level of said analog input signal in accordance with results of a comparison achieved by the level comparator means;

a plurality of detection means each for detecting a specified state of output signals from a set of an m number of level comparator means which receive consecutive reference levels, where m is less than n;

a second output means for outputting digital signals corresponding to the number of sets of level comparator means whose output signals are detected by the detection means to be in the specified state; wherein

each of said detection means is a three-input NAND gate, two input terminals of which are connected to the output terminals of two level comparator means, and the third input terminal of which is connected the output of a third level comparator means through an inverter, said three level comparator means forming a set, and the output signals from these three level comparator means are detected to be in a specified state when they have logic levels "1", "1" and "0", respectively.

4,600,917

GATE-TURN-OFF THYRISTOR FAILURE DETECTING CIRCUIT

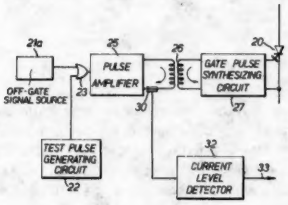
Nagataka Seki, Fuchu; Shunichi Koike, Ichikawa, and Yukio Watanabe, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 31, 1983, Ser. No. 547,254

Claims priority, application Japan, Oct. 30, 1982, 57-191463

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—645 **8 Claims**



1. A gate-turn-off thyristor failure detecting circuit comprising:

an off-gate signal source;

a pulse amplifier connected to said off-gate signal source for amplifying the off-gate signal;

a pulse transformer having primary and secondary windings, said primary winding being connected to said pulse amplifier;

a gate pulse synthesizing circuit for producing a gate pulse which is applied to a gate of the gate-turn-off thyristor, said gate pulse synthesizing circuit being connected to said secondary winding of said pulse transformer;

means for detecting a signal flowing through said primary winding of said pulse transformer; and

means for comparing the output signal from said detecting means with a predetermined value to produce an output signal from said comparing means indicative of the failure of the gate-turn-off thyristor.

4,600,918

EQUIPMENT FOR REPRODUCTION OF ALPHANUMERICAL DATA

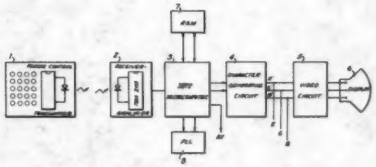
Pietro Belisomi, Pinerolo, and Attilio Farina, Torino, both of Italy, assignors to Indesit Industria Elettrodomestici Italiana SpA, Rivalta, Italy

Filed Jun. 28, 1982, Ser. No. 393,127

Claims priority, application Italy, Jun. 29, 1981, 67892 A/81; Mar. 9, 1982, 67274 A/82

Int. Cl.[4] G09G *1/00*

U.S. Cl. 340—711 **23 Claims**



1. A television receiver comprising:

(a) display means for displaying a color image;

(b) character generation means capable of being operatively coupled at video frequencies to said display means;

(c) a keyboard for inputting coded data signals corresponding to characters and control signals corresponding to commands by remote control;

(d) random access memory (RAM) means for non-volatilely storing data signals, and

(e) control means connected to said keyboard, said RAM means, and said character generation means, said control means comprising means for decoding coded data signals received from said keyboard, means for storing decoded data signals in said RAM means, means for sending said decoded data signals to said character generation means, means for sending format control signals received from said keyboard to said character generation means for displaying characters corresponding to said data signals received from said keyboard and formatting said characters in accordance with said format control signals, means for reading data signals stored in said RAM means, buffer means for temporarily storing data signals read from said RAM means, means for sending said data signals stored in said buffer means to said character generation means for displaying characters corresponding to said data signals, and means for controlling the operating mode of said television receiver in response to mode control signals received from said keyboard,

wherein said television receiver is placed in a first operational mode in which said character generation means is coupled to said keyboard for displaying a picture comprising formatted characters corresponding to data signals directly input by way of said keyboard and stored in said RAM means in response to first mode control signals and in a second operational mode in which said character generation means is coupled to said RAM means for displaying a picture comprising formatted characters corresponding to stored data signals read-out from said RAM means in response to second mode control signals.

4,600,919

THREE DIMENSIONAL ANIMATION

Garland Stern, Brookville, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Aug. 3, 1982, Ser. No. 404,965

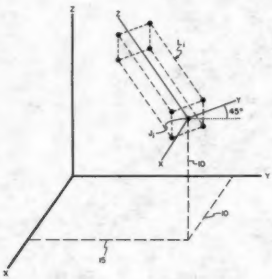
Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—725 **22 Claims**

1. A method for generating a sequence of video frames representative of three-dimensional animation, comprising the steps of:

storing a plurality of key frames, each including a common figure having one or more joints, each joint having associated therewith a set of vectors defining a limb, each joint being defined in each key frame by operator-controllable parameters which determine in three dimensions the position, rotational orientation, and scale factors of a local coordinate system in which the limb vectors are placed;

generating a plurality of in-between frames which include said common figure having one or more joints and associated limbs corresponding to the joints and associated limbs



of said common figure in successive key frames, the parameters of the joints of an in-between frame being obtained as follows:

(a) performing an interpolation, in each dimension, of the position, rotational orientation, and scale factor, for the local coordinate system associated with a joint, such that the interpolated parameter values of the joint lie between the parameter values associated with the corresponding joints of the successive key frames; and

(b) repeating step (a) for other joints of said common figure.

4,600,920

DISPLAY DEVICE FOR PRODUCING OVERLAPPED DISPLAY OF CHARACTER PATTERNS

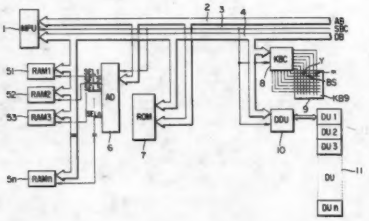
Masaru Makita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 26, 1983, Ser. No. 498,312

Claims priority, application Japan, Jun. 15, 1982, 57-103540

Int. Cl.⁴ G09G *1/14*

U.S. Cl. 340—735 **3 Claims**



1. A display device comprising:

(a) keyboard means for producing character code signals representing characters;

(b) character generating means for converting each character code signal produced by said keyboard means into a corresponding character pattern signal representing a character pattern;

(c) memory means for storing at locations therein character pattern signals supplied from said character generating means;

(d) means for visually representing a character pattern represented by the character pattern signal stored in said memory means;

(e) means for generating a composite character display signal; and

(f) control means, responsive to a composite character display signal generated by said composite character display signal generating means, for causing a character pattern signal supplied from said character generating means after generation of a composite character display signal to be stored at a single location in said memory means in overlapping relation with a character pattern signal supplied from said character generating means before generation of the composite character display signal thereby to produce a composite character pattern signal.

4,600,921

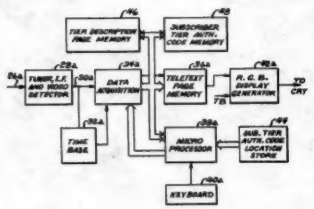
FULL-FIELD TELETEXT SYSTEM WITH DYNAMIC ADDRESSABILITY

William L. Thomas, Libertyville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 19, 1983, Ser. No. 543,588

Int. Cl.⁴ H04Q *9/00*; H04N *7/18*

U.S. Cl. 340—825.31 **21 Claims**



1. In a teletext system having a head-end station, a group of subscriber stations, a data base comprising a multiplicity of data pages transmitted from the head-end station to the subscriber stations on a video channel, each data page comprising a group of data, said data base arranged into program service levels each comprising a respective set of pages in the data base, the data base and service levels being individually accessible to particular subscribers on a selective basis in response to subscriber requests for access to the teletext system, the improvement for controlling and adjusting subscriber access to particular service levels comprising:

means at the head-end station for transmitting to each of the subscriber stations a service level description page comprising data defining each of said service levels and a subscriber service level authorization code page comprising a group of subscriber service level authorization codes for plural subscribers, each of said authorization codes specifying the service levels to which a corresponding subscriber is entitled to have access; and

a respective logic circuit located at each subscriber station responsive to said description page and said authorization page for controlling access at its subscriber station to service levels on the basis of the authorization code corresponding to such subscriber station and the service level corresponding to the request by the subscriber.

4,600,922

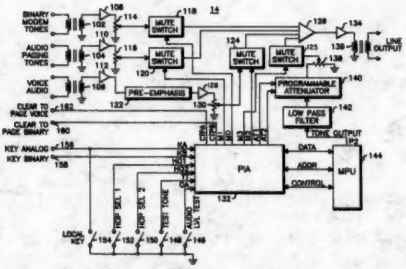
PAGING UNIVERSAL REMOTE CONTROL ENCODER

Stephen H. Dunkerton, Riverwoods, Ill.; David R. Petreye, Margate, Fla.; Gary D. Erickson, Mt. Prospect, and Gary R. Reynolds, Oakwood Hills, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 487,490, Apr. 22, 1983, abandoned. This application Sep. 11, 1985, Ser. No. 774,833

Int. Cl.[4] H04Q *9/00*; H04B *1/10*

U.S. Cl. 340—825.44 **9 Claims**



1. A method of formatting control tones, binary information signals and analog information signals for outputting thereof to a paging base station, over a single linking channel which allows the base station to continuously transmit a sequential analog or binary signal without dekeying the base station transmitter between said analog or binary signals, said method including the steps of:

(a) sequentially transmitting first and second control tones for a predetermined period of time over said linking channel to activate said base station for the transmission of an analog or binary paging signals;

(b) in response to an analog key request input immediately outputting over said linking channel for transmission by said base station, an analog information signal followed by a pause and then, in response to a binary input, outputting a binary information signal; and

(c) in the absence of said analog key request input, generating a pause for a predetermined period of time following said second control tones, and, in response to a binary key request input, outputting over said linking channel for transmission by said base station a binary information signal.

4,600,923

REMOTE METER DISPLAY UNIT

Irwin A. Hicks, Radnor, and Joseph P. Schroeck, Cheltenham, both of Pa., assignors to American Meter Company, Philadelphia, Pa.

Filed May 4, 1984, Ser. No. 607,078

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—870.02 **11 Claims**

1. An arrangement for displaying the reading of a meter at a location remote from said meter comprising:

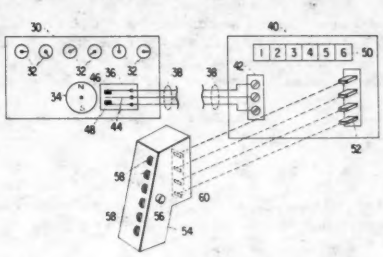
switching means at said meter adapted to alternately close one of a pair of circuits each time a measured volume of metered product passes through said meter;

a respective conductor connected to each of said circuits and extending to said remote location;

a multidigit display unit;

counting means coupled to said display unit for causing said display unit to display digits corresponding to the contents of said counting means, said counting means having a count input and a reset input, said counting means responding to a count signal at said count input for incrementing its contents and responding to a reset signal at said reset input for setting its contents to a predetermined value;

pulse means coupled between said conductors and said count input for generating said count signal; and



fault detection means coupled between said conductors and said reset input for generating and thereafter maintaining said reset signal when neither of said circuits is closed.

4,600,924

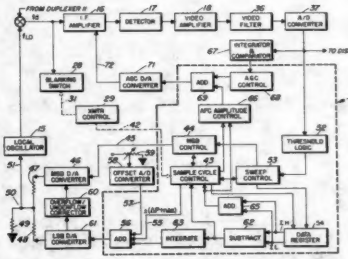
AUTOMATIC FREQUENCY CONTROL FOR RADAR RECEIVER

James R. Lobsinger, Boca Raton; Steven R. Sweet, Margate, both of Fla., and Eckard F. Natter, Phoenix, Ariz., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 21, 1984, Ser. No. 591,713

Int. Cl.[4] H03L *7/08*

U.S. Cl. 343—17.1 R **10 Claims**



1. In a pulse-type radar system having a transmitter, an antenna, a superheterodyne receiver and a duplexer for coupling said transmitter and said receiver to said antenna, said receiver including

a voltage controlled local oscillator,

a mixer for combining the output of said local oscillator with signals applied to the input of said receiver to produce intermediate frequency signals, an intermediate frequency amplifier having automatic gain control means for amplifying said intermediate frequency signals and a video detector for detecting the output of said intermediate frequency amplifier;

the method of automatically controlling the frequency of said local oscillator, comprising,

generating a first digital number;

converting said first digital number to a first analog voltage;

applying said first analog voltage as the control voltage for said local oscillator to control the frequency thereof;

varying the value of said first digital number during the time output from said transmitter is present at said duplexer;

sampling the output of said video detector to determine the amplitude thereof during the time output from said transmitter is present at said duplexer and leakage signals from said transmitter pass through said duplexer to said receiver input;

comparing said sampled video detector output with a predetermined threshold;

discontinuing variation of the value of said first digital number when said sampled video output exceeds said predetermined threshold; and

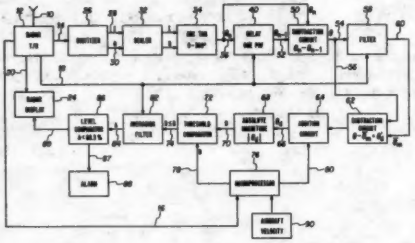
maintaining said first digital number at the value existing at the time variation thereof is discontinued to control the frequency of said local oscillator during the time signals from said antenna are applied through said duplexer to said receiver.

4,600,925

VECTOR PHASE ANGLE CHANGE DISTRIBUTION PROCESSOR

Orville J. Alitz, and David P. Moos, both of Marion, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1983, Ser. No. 481,535
Int. Cl.[4] G01S *13/95*
U.S. Cl. 343—5 SA **21 Claims**
MICROFICHE APPENDIX INCLUDED
(5 Microfiche, 258 Pages)



1. A system for estimating the spectral width of radar returns comprising:

means for receiving successive reflected radar spectral returns from a target at at least one range and providing an output signal for each return representing the vector phase angle of that return;

means responsive to said successive returns for producing successive signals representing phase angle change between successive returns;

means for filtering said phase angle change signals over time to produce an average angular mean signal output;

means for subtracting said average angular mean signal output from each of said phase angle change signals to produce a deviation angle signal; and

means for comparing said deviation angle signal with a threshold signal to provide an output representing return spectral width.

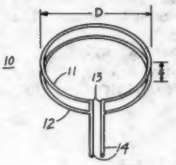
4,600,926

TELEVISION ANTENNA

Stanley L. Powell, 3885 Sunhaven La., Kingman, Ariz. 86401

Filed Jul. 28, 1983, Ser. No. 518,030
Int. Cl.[4] H01Q *11/12*
U.S. Cl. 343—742 **2 Claims**

1. A TV antenna for the VHF and UHF bands, audio and video, and the FM band from a frequency of about 60 megacycles to about 884 megacycles comprising a single pair of conductors with respective ends, each arranged in a circle whose circumferences are equal to each other and whose diameters are equal to about sixteen and three-quarter inches, said circular conductors are concentrically arranged, disposed in planes parallel to each other and spaced about four inches apart, and the respective ends of said pair of conductors are connected together, the ends of each single conductor being disposed immediately next to but insulated from each other, the said connected ends being adapted to be connected to input antenna



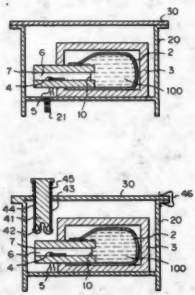
terminals of a utilization device, and said conductors having a size between #6 A.W.G. and #18 A.W.G. wire.

4,600,927

METHOD OF PRESERVING INK JET RECORDING HEAD

Hiroshi Sugitani, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 21, 1985, Ser. No. 714,448
Claims priority, application Japan, Mar. 30, 1984, 59-61139
Int. Cl.[4] G01D *15/18*; B65B *31/02*
U.S. Cl. 346—1.1 **17 Claims**



1. A method of preserving an ink jet recording head comprising an ejecting element for flying ink droplets, an elastic ink tank portion containing an ink to be fed to the ejecting element, a casing housing the ink tank portion, characterized by housing the ink jet recording head in a preserving container, elevating the gas pressure in the preserving container to a pressure higher than atmospheric pressure, and keeping the pressurized state.

4,600,928

INK JET PRINTING APPARATUS HAVING ULTRASONIC PRINT HEAD CLEANING SYSTEM

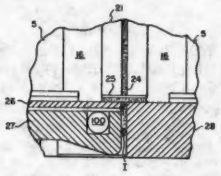
Hilarion Braun, Xenia, and Michael J. Piatt, Enon, both of Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1985, Ser. No. 722,543
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **16 Claims**

1. In ink jet printing apparatus of the type including a print head assembly including an orifice plate for producing ink droplet streams and a charge plate located in drop charging relation to said orifice plate, the improvement comprising:

(a) means for supporting a liquid mass in contact with both

said orifice plate and the drop charging surface of said charge plate; and



(b) means providing ultrasonic cleaning vibrations to a liquid mass so supported.

4,600,929

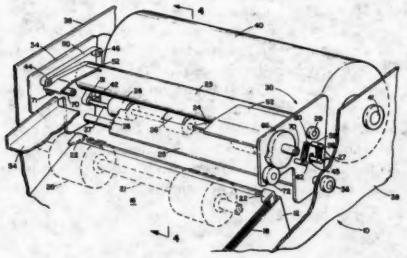
APPARATUS FOR HANDLING PAPER IN A PRINTER

Ramon M. Cardona, Des Plaines, and Kenneth W. Wiater, Palatine, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Jun. 1, 1984, Ser. No. 616,028

Int. Cl.[4] G01D *15/24*; G03G *15/00*; B65H *5/22, 5/00*

U.S. Cl. 346—134 4 Claims



1. An apparatus for transferring a sheet of paper from a paper supply station into contact with a transfer drum carrying an inked indicia pattern, and thereafter to a paper receiving station, comprising in combination:

(a) a base;

(b) a transfer drum carried by said base;

(c) a paper stripping roller spaced from said drum and carried by said base for delivering a sheet of paper from a stack at a paper supply station;

(d) a paper drive mechanism carried by said base, intermediate said roller and drum, for transporting said paper from the former to the latter, said paper drive mechanism having a rest position and a transfer position and including:

(i) a frame having a pivot rod affixed thereto and a pair of spaced side plates supported for rotation about said rod;

(ii) a paper transfer roller mounted between said plates;

(iii) a pressure roller mounted between said plates adjacent said transfer roller;

(iv) guide means for guiding said paper between said transfer and pressure rollers;

(v) a plurality of guide rollers for guiding said paper as it passes to said paper receiving station;

(vi) a belt positioned between said guide rollers and said transfer roller for maintaining said paper snugly against said transfer roller;

(vii) said guide rollers defining an "L" shaped belt path with said transfer roller and said pressure roller being disposed within an acute angle defined by said "L" shaped belt path;

(e) means for selectively moving said paper drive mechanism into and out of contact with said drum.

4,600,930

RECORDING MATERIAL WHICH REACTS UNDER THE INFLUENCE OF HEAT, ITS PREPARATION AND THE USE OF ACID-MODIFIED POLYMERS AS ACCEPTORS IN THIS RECORDING MATERIAL

Hubertus Psaar, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 5, 1984, Ser. No. 658,341

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1983, 3337296

Int. Cl.[4] B41M *5/18*

U.S. Cl. 346—201 10 Claims

10. Use of acid-modified polymers of acrylonitrile as acceptors in recording materials which react under the influence of heat.

4,600,931

INK JET RECORDING APPARATUS

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

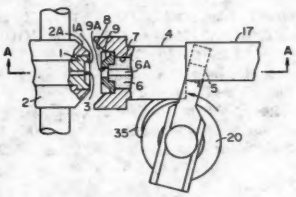
Continuation of Ser. No. 514,145, Jul. 14, 1983, abandoned, which is a continuation of Ser. No. 414,889, Sep. 3, 1982, Pat. No. 4,410,900, which is a division of Ser. No. 197,594, Oct. 16, 1980, abandoned. This application Sep. 11, 1984, Ser. No. 649,958

Claims priority, application Japan, Oct. 23, 1979, 54-135914; Jan. 21, 1980, 55-5425

The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R 3 Claims



1. Ink jet recording apparatus, comprising:

recording means having a tip end for ejecting ink to effect recording on a recording medium;

cap means for sealing the tip end of said recording means;

guide means for movably guiding said cap means to a position to seal the tip end of said recording means and to a position away from said recording means;

holding means for holding said cap means in a position where the tip end of said recording means is tightly sealed by said cap means; and

suction means connected to said cap means, for producing a negative pressure to suck the tip end of said recording means only when said cap means is in the position to seal said recording means.

4,600,932

ENHANCED MOBILITY BURIED CHANNEL TRANSISTOR STRUCTURE

Peter E. Norris, Cambridge, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 12, 1984, Ser. No. 660,175

Int. Cl.[4] H01L *29/80*

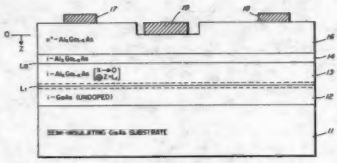
U.S. Cl. 357—22 5 Claims

5. An enhanced mobility buried channel transistor structure comprising

a semi-insulating substrate formed of a III-V semiconducting compound, having a pair of opposed surfaces;

an undoped layer of said compound deposited upon one of said surfaces of said substrate;

a first layer of an undoped compound formed of said III-V compound and a variable proportion of an element from Group III of the Periodic Table deposited on said undoped layer, where the proportion of said element varies through said first layer, from a maximum value distant from said undoped layer to a minimum proximal to said undoped layer;



a second layer of an undoped compound formed of III-V ternary or quaternary compound and said maximum proportion of said element, deposited on said first layer;

a doped layer of said last named compound formed of said III-V ternary or quaternary compound and said maximum proportion of said element, deposited onto said second layer;

a source electrode deposited onto said doped layer;

a drain electrode deposited onto said doped layer; and

a gate electrode deposited onto said doped layer, between said source electrode and said drain electrode.

4,600,933

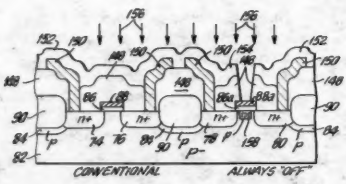
SEMICONDUCTOR INTEGRATED CIRCUIT STRUCTURE WITH SELECTIVELY MODIFIED INSULATION LAYER

Paul Richman, St. James, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Continuation-in-part of Ser. No. 826,867, Aug. 22, 1977, abandoned, which is a division of Ser. No. 750,368, Dec. 14, 1976. This application Jun. 19, 1979, Ser. No. 49,916

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.12 **2 Claims**



1. An M.O.S. integrated circuit comprising a substrate, source, drain, and channel regions of at least first and second M.O.S. transistors being formed in an upper surface of said substrate, a conductive interconnection system formed over said surface of said substrate, said interconnection system including a layer of doped polycrystalline silicon underlying, and being self-aligned with, a metallic layer, an opening selectively formed in said metallic layer, thereby to expose a portion of said layer of doped polycrystalline silicon underlying said opening in said metallic layer, said opening and said exposed portion of said layer of doped polycrystalline silicon directly overlying the channel region of at least one of said first and second transistors at which at least one electrical characteristic is made different from that associated with the other of said first and second transistors by the introduction of impurities into the channel region of said at least one of said first and second transistors through said opening in said metallic layer and the thus exposed portion of said layer of doped polycrystalline silicon.

4,600,934

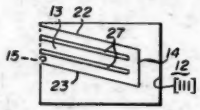
METHOD OF UNDERCUT ANISOTROPIC ETCHING OF SEMICONDUCTOR MATERIAL

Harry E. Aine, 30600 Page Mill Rd., and Barry Block, 30610 Page Mill Rd., both of Los Altos, Calif. 94022, assignors to Harry E. Aine and Barry Block, both of Palo Alto, Calif.

Continuation-in-part of Ser. No. 568,740, Jan. 6, 1984, abandoned. This application Jan. 25, 1984, Ser. No. 573,693

Int. Cl.[4] H01L *29/84, 21/308, 21/306;* **G01L** *1/22*

U.S. Cl. 357—26 **12 Claims**



1. In a method for undercut anisotropic etching of an etch stopped layer portion on a (110) face of diamond cubic semiconductor material, to form beam or bridge structures, said etch stopped layer portion which is to be undercut having a pair of opposing side edges, the steps of:

orienting said pair of opposing side edges of the etch stopped layer portion which is to be undercut at an angle to the most nearly parallel one of the {111} traces on the (110) face being etched, so that said oriented side edges will be undercut from the sides; and

contacting the (110) face being etched with an isotropic etchant for the semiconductive material so as to essentially completely undercut the etch stopped layer portion from both of said side edges in a direction toward the opposing side edge.

4,600,935

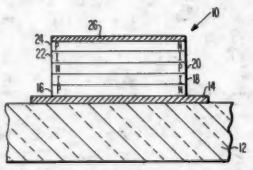
BACK-TO-BACK DIODES

Joseph Dresner, Princetown Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 14, 1984, Ser. No. 671,315

Int. Cl.[4] H01L *29/12, 45/00, 27/12, 23/32*

U.S. Cl. 357—58 **8 Claims**



1. A semiconductor back-to-back diode comprising

a substrate,

a first layer of hydrogenated amorphous silicon of one conductivity type on said substrate,

a second layer of intrinsic hydrogenated amorphous silicon on said first layer,

a third layer of hydrogenated amorphous silicon of the opposite conductivity type on said second layer,

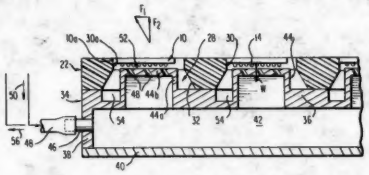
a fourth layer of intrinsic hydrogenated amorphous silicon on said third layer, and

a fifth layer of hydrogenated amorphous silicon of the one conductivity type on said fourth layer, each of said layers being of substantially the same thickness.

4,600,936
CHIP REGISTRATION MECHANISM

Henri A. Khoury, Yorktown Heights, N.Y., and Bruce E. Tompkins, Brookfield Center, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1983, Ser. No. 513,188
Int. Cl.[4] H01L *23/42, 23/44, 23/46*
U.S. Cl. 357—79 4 Claims



1. A carrier for retaining and positioning integrated circuit chips having identification codes on one surface thereof such that said chip code may be read, said carrier compprising:

a tray having multiple cells,

each cell receiving an individual integration circuit chip,

said cell defining a reference cavity oversized relative to said chip and having at least one reference surface,

a chip registration base assembly, said base assembly comprising a support plate extending across said tray and underlying said cells,

a plurality of individual pedestals projecting upwardly from said support plate within the cells,

said pedestals having a transverse cross-section less than that of said cavity and said pedestals terminating in a flat top surface underlying and initially supporting said chip,

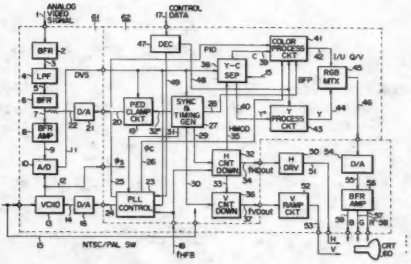
a lid extending across said tray and overlying said cells to retain said chips when said lid, said tray and said chip registration base assembly are combined in that order to form a stacked array,

and nozzle means carried by said pedestals for jetting air from the top surface of said pedestals against the bottoms of said chips of a pressure sufficient for supporting said chips on an air film and for imparting a transverse force to each chip to move an edge of the chip against said at least one cavity reference surface and for applying vacuum from the top surface of said pedestals against the bottoms of said chips sufficient to secure said chips in said orientation, wherein said tray comprises vertically spaced top and bottom walls, and wherein said cells comprise intersecting inclined sidewalls and straight sidewalls in order from said tray top wall to said tray bottom wall when said tray is positioned to initially receive said chips and wherein the transverse dimension between said cell straight sidewalls are in excess of the transverse dimensions of said chips received thereby, and wherein said lid underlies said tray and said lid and tray are inverted as an assembly to initially receive said chips, and wherein said chip registration base assembly is inverted and placed onto said tray such that the pedestals project into said tray cavities through said tapered sidewall portions of said cells after said chips are positioned within said cavities wherein the stacked assembly thus formed is further inverted prior to supplying air under pressure to said nozzle means, and wherein the height of the pedestals is approximately equal to the height of the tapered sidewall portions of said cells, such that air jetting against the bottom of said chips causes the tops of said chips to contact said lid while simultaneously an edge of said chip is positioned against a corresponding cell at least one reference surface and wherein vacuum applied from said nozzle means secures said chips in said orientation, and wherein said support plate includes recessed relief channels about said pedestal beneath said tray being open to the space between said pedestals and the tray cell sidewalls, and said carrier further comprises means for venting said relief channels to the atmosphere to prevent flutter of each said chip relative to said at least one reference surface during air jet application to the bottom of said chip by preventing air flow between the edge of the chip and said at least one reference surface.

4,600,937
DIGITAL TELEVISION RECEIVER WITH DIGITAL SYNC/REPRODUCTION CIRCUIT

Yukinori Kudo, Fujisawa, and Susumu Suzuki, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 26, 1983, Ser. No. 517,444
Claims priority, application Japan, Jul. 30, 1982, 57-132271
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—21 R 8 Claims



1. A digital television receiver comprising:

digital conversion means for converting an analog video signal to a digital video signal;

color process means coupled to said digital conversion means for composing digital color signals from said digital video signal;

analog conversion means coupled to said process means for composing analog color signals from said digital color signals, said analog color signals being of a form suitable for driving a color CRT; and

timing control means, coupled to said digital conversion means and to said process means, responsive to said digital video signal, for controlling a converting operation of said digital conversion means and a composing operation of said color process means,

wherein said digital conversion means includes:

converter means, responsive to a sampling clock, for analog-to-digital converting said analog video signal to said digital video signal, the converting rate of said converter means depending on said sampling clock;

generator means coupled to said converter means for generating said sampling clock; and

controller means coupled to said generator means and to said timing control means for controlling phase and frequency components of said sampling clock so that a phase of said sampling clock corresponds to a prescribed phase axis of a color system applied to the digital television receiver,

wherein said color process means includes:

separator means coupled to said converter means for separating a digital chrominance and digital luminance signals from said digital video signal;

first processor means, coupled to said separator means and to said timing control means, for processing said digital chrominance signal to generate a digital demodulated output under the control of said timing control means;

second processor means coupled to said separator means for processing said digital luminance signal to generate a digital processed luminance output;

matrix means, coupled to said first and second processor means, for generating said digital color signals by combining said digital demodulated output and said digital luminance output with a given matrix coefficient; and

a horizontal counter means, coupled to said separator means and to said timing control means, and being responsive to a horizontal flyback signal, for controlling said horizontal flyback signal to generate a horizontal drive signal and for providing a horizontal sync mode signal to said separator means under the control of said timing control means, said horizontal drive signal being suitable for horizontal scanning said CRT,

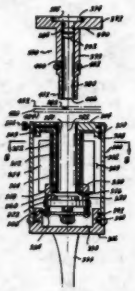
wherein said separator means performs the separating operation for one color system when said horizontal sync mode signal designates said one color system, and performs the separating operation for another color system when said horizontal sync mode signal designates said another color system.

4,600,938

FOCUSABLE VIDEO CAMERA FOR USE WITH ENDOSCOPES

Erik Sluyter, Santa Barbara, and Edward A. Wooff, Jr., Ventura, both of Calif., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Feb. 7, 1984, Ser. No. 578,106
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 **7 Claims**



1. A highly compact focusable video camera for use in medical and surgical procedures in conjunction with an endoscope comprising:

a two-part body comprising:

a first body portion having an optically apertured forward end portion and a cylindrical sidewall; and

a second body portion having a rearward end portion and a cylindrical sidewall;

the first and second body portions being slidable one within the other and having portions of their respective cylindrical walls overlapping;

coacting means on the overlapped portion of the cylindrical wall of each body portion to cause relative forward and rearward axial motion of the body portions upon rotation of one body portion relative to the other;

the body portions defining a cavity;

an optical system inside the cavity aligned with the optical aperture to define an optical axis extending through the optical system and outside the body for receiving and transmitting optical endoscope imagery;

the optical system comprising:

a forward portion mounted on the first body portion; and

a rearward portion mounted on the second body portion;

a sensor-converter operatively placed inside the cavity to receive optical imagery passing through the optical system for converting the optical imagery to unprocessed video electronic signals; and

video electronic preprocessing circuit means in the cavity adjacent the optical system;

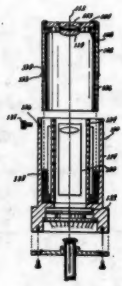
whereby the optical system may be focused by relative rotation of the first and second body portions.

4,600,939

FOCUSABLE VIDEO CAMERA FOR USE WITH ENDOSCOPES

Erik Sluyter, Santa Barbara, and Edward A. Wooff, Jr., Ventura, both of Calif., assignors to Circon Corporation, Santa Barbara, Calif.

Filed Feb. 7, 1984, Ser. No. 578,107
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 **11 Claims**



1. A highly compact focusable video camera for use in medical and surgical procedures in conjunction with an endoscope comprising:

a body having an apertured front end portion and elongated side walls defining a cavity extending from the front end portion to a rear end portion;

an adjusting element having an optical aperture positioned external of the body forward of the front end portion;

an extension element integral to the adjusting element extending through, and movable relative to the aperture in the front end portion, and defining an optical path from the optical aperture of the adjusting element into the cavity;

an optical system aligned with the optical aperture and the optical path to define an optical axis extending through the optical system and outside the body for receiving and transmitting optical endoscope imagery;

the optical system comprising:

a forward portion mounted in the extension element for forward and rearward movement; and

a rearward portion fixedly mounted in the cavity;

a sensor-converter operatively placed inside the cavity to receive optical imagery passing through the optical system for converting the optical imagery to unprocessed video electronic signals;

video electronic preprocessing circuit means in the cavity extending around the outside of the rearward portion of the optical system; and

releasable holding means for selectively fixing the position of the forward portion of the optical system relative to the rearward portion of the optical system;

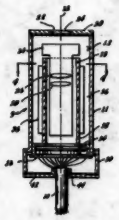
whereby the optical system may be focused by moving the adjusting element forward or rearward along the optical axis, thereby moving the forward portion of the optical system relative to the rearward portion of the optical system, and upon such focusing the forward portion of the optical system may be fixed in place by the releasable holding means.

4,600,940

VIDEO CAMERA FOR USE WITH AN ENDOSCOPE AND METHOD FOR MAKING SAME

Erik Sluyter, Santa Barbara, Calif., assignor to Circon Corporation, Santa Barbara, Calif.

Filed Feb. 7, 1984, Ser. No. 578,108
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—98 9 Claims



1. A video camera for use in medical surgical procedures in conjunction with an endoscope which produces an optical image comprising:

an optical system for receiving and optically processing an optical image from an endoscope;

a solid-state sensor-converter operatively positioned to receive the optical image after it has passed through the optical system and for converting the optical image to unprocessed video signals;

video electronic preprocessing circuit means adjacent the optical system and electronically connected to receive the output of the sensor-converter and mechanically mounted around the optical system;

means for transmitting preprocessed output signals of the video electronic preprocessing circuit means to a remote location to a video output circuit; and

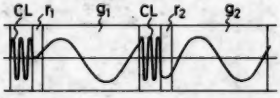
soakable enclosure means surrounding the optical system, the solid-state sensor-converter and the video electronic preprocessing circuit means and including means for permitting input of the optical image into the optical system and means for permitting transmission of the preprocessed output signals.

4,600,941

SCRAMBLING SYSTEM FOR AUDIO FREQUENCY SIGNALS

Akira Sakamoto; Toshihiko Waku; Takeshi Fukami; Masakatsu Toyoshima, all of Tokyo, and Michimasa Komatsubara, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 560,957
Claims priority, application Japan, Dec. 17, 1982, 57-222299
Int. Cl.[4] H04N 7/167
U.S. Cl. 358—121 7 Claims



1. In a scrambling system for an audio frequency signal in which an audio signal is divided into blocks, each block is formed of a plurality of frames, said frames are re-arranged on a timebase in a predetermined order for each block so as to provide an encoded signal, and said encoded signal is decoded by being re-arranged on the timebase in an original order, the improvement comprising:

first signal processing means for inserting a redundant portion between adjoining frames and timebase-compressing said frames in response to said redundant portions upon encoding;

control signal generating means for inserting a control signal other than an audio information signal into said redundant portions;

control signal detecting means for detecting said control signal upon decoding; and

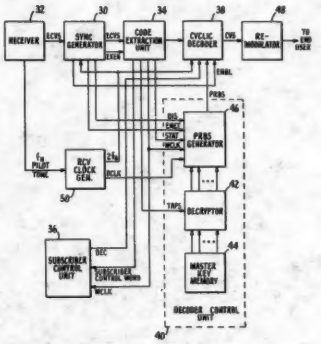
second signal processing means for removing said redundant portions in synchronism with said detected control signal and timebase-expanding said frames in response to said redundant portions.

4,600,942

SECURE CODING AND DECODING SYSTEM AND METHOD FOR TELEVISION PROGRAM SIGNALS

Robert W. Field, Fountain Valley; Clarence D. Perr, Brea, and Ronald R. Gerlach, Mission Viejo, all of Calif., assignors to Telease, Inc., Los Angeles, Calif.

Continuation of Ser. No. 403,107, Jul. 29, 1982, abandoned. This application Nov. 27, 1984, Ser. No. 675,452
Int. Cl.[4] H04N 7/167; H04L 9/00
U.S. Cl. 358—122 29 Claims



1. Apparatus for transmitting an encoded television signal to prevent unauthorized viewing of a television program, comprising:

a program source for generating a composite video signal;

a plurality of delay elements connected in series to receive successive parts of the composite video signal;

a switching device having a plurality of input terminals respectively connected to said delay elements to receive a delayed composite video signal, and an output terminal that is selectively connected to one of said input terminals;

means for controlling said switching device to alternately (a) maintain said output terminal connected to one of said input terminals, and (b) sequentially connect said output terminal to each of said input terminals in a cyclic manner, to thereby generate an encoded video signal; and

means for transmitting the encoded video signal.

4,600,943

SAMPLING PULSE GENERATOR

Toshiyuki Tanabe, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 4, 1983, Ser. No. 548,772
Claims priority, application Japan, Nov. 9, 1982, 57-196388
Int. Cl.[4] H04N 7/087, 7/04
U.S. Cl. 358—147 18 Claims

1. A sampling pulse generator for use in sampling a character or symbolic data signal in a transmitted data signal, said symbolic data signal containing a clock run-in signal which is used

as a phase reference of this symbolic data signal, said sampling pulse generator comprising:

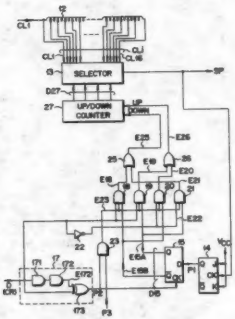
signal source means for generating a reference signal having a frequency corresponding to the frequency of said symbolic data signal to be samplied;

delay means coupled to said signal source means, for delaying said reference signal and providing a plurality of sampling clocks, the frequency of each of said sampling clocks being equal to the frequency of said reference signal, and each phase of said sampling clocks with respect to said reference signal having an individual value;

selector means coupled to said delay means and being responsive to designation data, for selecting a smpling pulse output from said sampling clocks according to the content of said designation data;

designation means coupled to said selector means and being responsive to gate data, for generating said designation data such that the content of said designation data is incremented or decremented according to the content of said gate data; and

comparator means coupled to said selector means and to said designation means, for generating a feedback signal which



is in-phase and synchronized with said sampling pulse output, and for comparing the phase of said feedback signal with that of said clock run-in signal and generating said gate data according to the result of comparison, said selector means selecting a particular one of said sampling clocks based on the result of comparison in said comparator means, so that the phase difference between said feedback signal and said clock run-in signal becomes minimum and the selected particular one of said sampling clocks is used as said sampling pulse output;

said selector means, designation means and comparator means jointly forming a closed negative feedback loop which operates to minimize the phase difference between said feedback signal and said clock run-in signal which is the control target of said feedback loop;

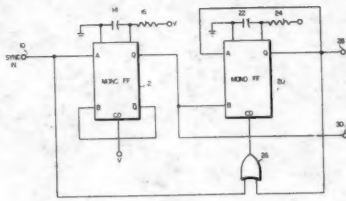
said closed negative feedback loop including means responsive to an on/off instruction, for opening said closed feedback loop when the content of said on/off instruction indicates the "off" of the negative feedback operation, so that the content of said designation data is fixed, said feedback loop being closed when the content of said on/off instruction indicates the "on" of the negative feedback operation.

4,600,944

LOW COST SYNCHRONIZING SIGNAL SEPARATOR

Gregory A. Williams, Elk Grove Village, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 6, 1984, Ser. No. 638,091
Int. Cl.[4] H04N *5/10, 5/08;* **H03K** *5/22*
U.S. Cl. 358—154 **3 Claims**



1. A synchronizing signal separator comprising:

an input terminal for receipt of input pulses consisting of narrow pulses and broad pulses;

first means including a first monostable flip-flop responsive to the leading edges of said pulses for producing first output pulses at a first output terminal, said first monostable flip-flop being positive edge nonretriggerable and including a first timing circuit for determining a first duration of said first output pulses at said first output terminal; and

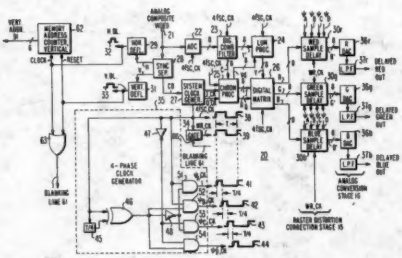
second means including a second monostable flip-flop receiving said input pulses and said first output pulses and being responsive to the trailing edges of said first output pulses in the presence of said input pulses for producing second output pulses at a second output terminal, said second monostable flip-flop being negative edge nonretriggerable and including a second timing circuit for determining a second duration in excess of the duration of said broad pulses.

4,600,945

DIGITAL VIDEO PROCESSING SYSTEM WITH RASTER DISTORTION CORRECTION

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 31, 1983, Ser. No. 480,907
Int. Cl.[4] H04N *5/14, 5/68*
U.S. Cl. 358—160 **15 Claims**



10. A raster distortion correction arrangement, comprising:

means for developing successive video samples that are in synchronous relationship with a synchronizing signal;

a scanning generator operated synchronously with said synchronizing signal for developing a raster, said raster being subject to error that tends to introduce distortion

into the raster display of the picture information contained in said video samples;

means for storing said video samples for subsequent read out;

a clock generator capable of generating a plurality of read clocks;

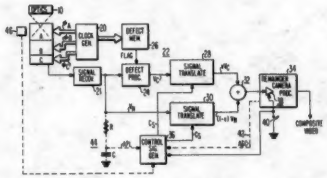
means coupled to said clock generator and responsive to a selection signal for enabling successive ones of said plurality of read clocks to be applied to said storing means for reading out the stored video samples at a rate determined by the selected read clocks; and

means for generating a selection signal in respect to said raster distortion that causes said stored video samples to be read out at a rate that produces a display of said picture information corrected for said distortion.

4,600,946
ADAPTIVE DEFECT CORRECTION FOR SOLID-STATE IMAGERS

Peter A. Levine, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 31, 1985, Ser. No. 697,131
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—163 **11 Claims**



9. A television camera comprising:

optical means for imaging light from a scene;

a solid-state imager, subject to low contrast defective pixels, for developing a video signal in response to light image by said optical means onto said solid-state imager;

first and second signal processing means, said first signal processing means including a defect corrector responsive to said imager supplied video signal for developing a defect corrected video signal V_c and a first signal translation stage, and said second signal processing means including a second signal translating stage coupled to be responsive to the signals supplied from said imager for supplying a video signal V_n which is not defect corrected, the amount of signal being translated from the input to the output of said first and second signal translating stages being continuously adjustable in a complementary fashion; and

combining means for combining signal provided at the output of said first and second signal translating stages for developing an adaptively defect corrected video signal.

4,600,947
TELEVISION SOUND MUTE CIRCUIT

William Chamberlain, Lombard, and John C. Weigand, Oak Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

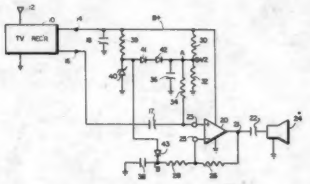
Filed Feb. 14, 1984, Ser. No. 580,049
Int. Cl.⁴ H04N *3/24*
U.S. Cl. 358—165 **5 Claims**

1. A turn-on circuit for an amplifier in a television receiver, said amplifier having an inverting input terminal, a noninverting input terminal and an output terminal, with the output terminal being coupled via a feedback circuit to the inverting input terminal, and an operating terminal connected to a source of B+ potential, comprising:

a voltage divider connected to said source of B+ potential, said voltage divider having a junction coupled to said noninverting input terminal;

a first charging circuit coupled to said inverting input terminal;

a second charging circuit coupled to said noninverting input terminal, said second charging circuit including a first filter capacitor coupled to said junction;

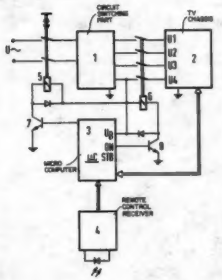


said first charging circuit having a shorter effective time constant than said second charging circuit, whereby said inverting input terminal is maintained at a greater potential than said noninverting input terminal for a time immediately after energization of said amplifier.

4,600,948
METHOD TO SWITCH-OFF THE STANDBY OPERATION OF A TELEVISION RECEIVER

Rainer Dangschat, Landsham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 417,092, Sep. 13, 1982, abandoned. This application May 15, 1985, Ser. No. 734,802
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137063
Int. Cl.⁴ H04N *5/63*
U.S. Cl. 358—190 **2 Claims**



1. Method for controlling a power supply for a television receiver which has operating modes "on", "stand-by" and "off" and wherein the television receiver includes a microprocessor having a timer function and a master switch having a trigger winding for switching the receiver from the "stand-by" to the "off" mode, the method which comprises:

operating the microprocessor as a timer for changing the receiver from the "stand-by" mode to the "off" mode, after the receiver has been in the "stand-by" mode only for a defined length of time;

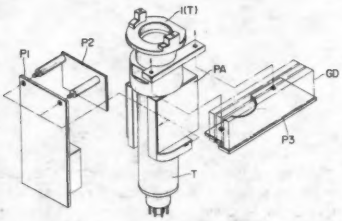
setting the master switch to the "off" mode by activating said trigger winding in response to an "off" command from the microcomputer;

disconnecting completely said television receiver, including said microprocessor from said power supply, in response to said master switch being in the "off" mode.

4,600,949
VIDEO CAMERA

Yukinori Koizumi, and Toshimitsu Harada, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,394
Claims priority, application Japan, Sep. 25, 1982, 57-167337
Int. Cl.[4] H04N 5/26
U.S. Cl. 358—229 11 Claims



1. A video camera comprising an image-forming lens system having an optical axis, and a light-beam splitting means capable of splitting an incident light-beam from said image-forming lens system into a primary optical path along said optical axis and leading into a view finder means, and

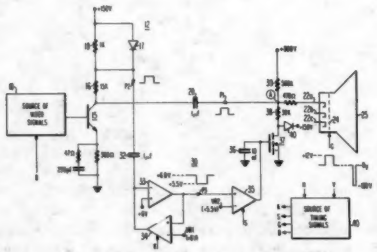
a secondary optical path bent at an angle to said primary optical path and leading into an electrical image-receiving means;

said video camera characterized in that an electrical circuit means is arranged so as to cover three sides of said light-beam splitting means other than a side facing said secondary optical path.

4,600,950
KINESCOPE BIAS SENSING CIRCUIT

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 1, 1984, Ser. No. 656,470
Int. Cl.[4] H04N 5/68
U.S. Cl. 358—243 7 Claims



1. In a video signal processing system including an image display device for displaying video information in response to a video signal applied to an intensity control assembly thereof, apparatus comprising:

a driver amplifier stage for providing a video drive signal from an output circuit of said driver amplifier stage to said intensity control assembly via a video output drive signal path;

means for causing said image display device to conduct a black current during image blanking intervals;

means for developing a signal representative of the magnitude of said black current conducted by said display device during image blanking intervals;

means for sensing said black current representative signal to provide a sensed signal with a magnitude related to the magnitude of said black current representative signal; and

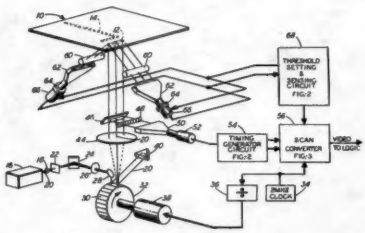
control means coupled to said intensity control assembly of said display device and responsive to said magnitude of said sensed signal from said sensing means for automatically maintaining a desired bias condition for said display device; wherein

said output circuit of said driver amplifier stage comprises a first resistance and a second resistance connected in series, said sensed signal being developed across said second resistance.

4,600,951
SCANNING SAMPLE, SIGNAL GENERATION, DATA DIGITIZING AND RETIMING SYSTEM

Frank H. Blitchington, Richmond, Va., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 20, 1983, Ser. No. 563,472
Int. Cl.[4] H04N 1/40, 1/00
U.S. Cl. 358—280 8 Claims



1. A system for generating timing signals in spaced synchronism with the movement of a laser beam comprising:

means for sweeping the laser beam across a swept space;

means for dividing the sweeping laser beam into a major portion and a minor portion, the major portion swept across the swept space;

an optical grating positioned in the path swept by the minor portion;

a photosensor for generating timing signals from the portion of the laser beam that passes through the optical grating;

a filter for blocking components of the timing signals that are in a frequency band outside of a predetermined frequency range;

a circuit tuned to oscillate at twice the frequency of the predetermined frequency range, said circuit receiving the signals that pass through the filter, the tuned circuit having sufficient ringing capability to continue oscillating with substantial energy for a plurality of cycles absent signals passing through the filter.

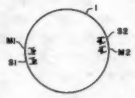
4,600,952
HELICAL SCAN VIDEO TAPE RECORDER WITH AUXILIARY HEADS FOR BLUR FREE HIGH SPEED REPRODUCTION PICTURES

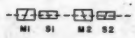
Kouichi Igata, Hirakata; Yoshihiro Deguchi, Kadoma, and Masaaki Kobayashi, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 1, 1985, Ser. No. 697,894
Int. Cl.[4] H04N 5/783
U.S. Cl. 360—10.3 3 Claims

1. A video tape recorder of helical scan type being constructed, permitting a magnetic tape to run at a constant first or second speed (the first speed being faster than the second speed) at the time of recording, by providing first and second

magnetic heads mutually differing in the azimuth at positions of 180° of a rotating substrate, disposing a third magnetic head of which azimuth is different from that of said first magnetic head but equal to that of said second magnetic head and a fourth magnetic head of which azimuth is different from that of said second magnetic head but equal to that of said first magnetic head at positions of 180° of a rotating head substrate in the vicinity of the first and second magnetic heads respectively, and using the first and second magnetic head when recording at said first speed and using the third and fourth magnetic heads when recording at said second speed, wherein the track widths of the first and second magnetic heads are equal and the track widths of the third and fourth magnetic heads are equal, and the centers of the track widths of the first and second magnetic heads and of the third and fourth magnetic heads are aligned.





4,600,953

HEAD SWITCHING SIGNAL PRODUCING CIRCUIT FOR A MAGNETIC RECORDING AND REPRODUCING APPARATUS

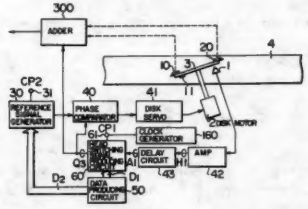
Takashi Furuhata, Yokohama; Taihei Nakama, and Yoshinori Masuda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1984, Ser. No. 579,595

Claims priority, application Japan, Feb. 14, 1983, 58-21445; Feb. 25, 1983, 58-29322

Int. Cl.⁴ H04N *5/783*

U.S. Cl. 360—10.3 **19 Claims**



1. A magnetic recording and reproducing apparatus in which two rotary magnetic heads are mounted on a rotary disk at an angle of 180° apart from each other and a video signal is recorded on a magnetic tape in the direction of width of said tape and this recorded video signal is reproduced therefrom during rotation of said rotary magnetic heads at a predetermined speed, said apparatus comprising:

means for detecting the rotational phase of either one of said two magnetic heads;

means for generating a predetermined clock signal;

counter means for counting the clock signal from said clock signal generating means and decoder means responsive to the count of said counter means for controlling said counter means to sequentially count first, second and third count values (N_0, N_1, N_0) each time of receipt of the output signal of said rotational phase detecting means;

means for setting said second count value (N_1) so that the sum (N_0+N_1) of the first and second sequential count values of said counter means is substantially equal to the value of the frequency of said clock signal divided by a frequency which is equal to twice the rotating speed of said magnetic heads; and

signal producing circuit means for producing a head switching signal for sequencing the video signal to be recorded/-reproduced by said two magnetic heads into one sequence signal on the basis of the count value of said counter means, including circuit means for outputting said head switching signal which is at either level or low level during the interval when said counter means is counting the second and third count values (N_1, N_0).

4,600,954

INSTALLATION FOR RECORDING AND RECOVERING BINARY SIGNALS ON A MAGNETIC INFORMATION CARRIER

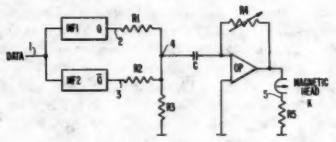
Norbert Bauer, Volckamerstr. 14, 8520 Erlangen, Fed. Rep. of Cermany

Filed Jun. 29, 1984, Ser. No. 625,979

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323336; Jun. 29, 1983, 3323335; Jun. 5, 1984, 3420927

Int. Cl.⁴ G11B *5/02, 5/09*

U.S. Cl. 360—67 **4 Claims**



1. An installation for recovering binary signals recorded on a magnetic information carrier and determined by the magnetization direction, which is operable on the basis of the detection of the zero passage of the magnetization between successive tracking elements of the information carrier, comprising three comparator means which compare the read-out voltage with a positive threshold voltage and with an equally large negative threshold voltage as well as with a voltage lying between said two threshold voltages, three multivibrator means, a first one of said multivibrator means producing a pulse of predetermined length when exceeding the positive threshold voltage from the positive side of the read-out signal, as determined by the first comparator means, the second multivibrator means being operable to produce a pulse of predetermined duration when exceeding the negative threshold voltage from the negative side of the read-out signal as determined by the second comparator means, and the third multivibrator means producing a pulse of predetermined length at the instant of zero passage of the read-out signal as determined by the third comparator means, and flip-flop means operable to be set by the output signals of said first and said third multivibrator means as well as of the second comparator means and to be reset by the output signals of the second multivibrator means and of the third multivibrator means as well as of the first comparator means, the output signal of said flip-flop means representing the recovered data signals.

4,600,955

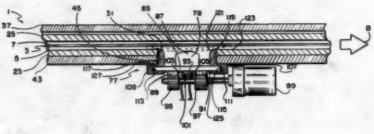
MEANS FOR STABILIZING MOVEMENT OF A FLEXIBLE DISK OVER A MAGNETIC HEAD

Curtis R. Regruit, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,554

Int. Cl.[4] G11B *5/016, 15/64, 21/08, 17/32*

U.S. Cl. 360—99 6 Claims



1. In a magnetic recording and/or reproducing apparatus for use with a cartridge of the type (a) containing a flexible magnetic disk for storing information signals and (b) having an opening that provides limited radial access to the disk, the combination comprising:

means for rotating the disk over the opening;

a magnetic head for recording or reproducing information signals on the disk;

means supporting said head for movement within the opening, radially across the disk; and

means for sealing the opening, with said head in the opening, to substantially prevent air from entering the opening from the exterior of the cartridge, though allowing air to be removed from the opening to the interior of the cartridge, whereby rotation of the disk over the opening can remove air from the opening to generate a pull down force on the disk toward said head.

4,600,956

ROTARY HEAD ASSEMBLY FOR USE IN A TAPE RECORDING/REPRODUCING APPARATUS

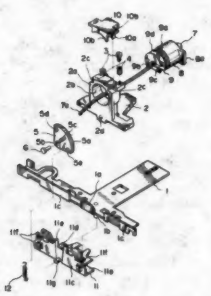
Tetsuo Nagase, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 628,973, Jul. 10, 1984, abandoned, which is a continuation of Ser. No. 383,171, May 28, 1982, abandoned. This application Feb. 19, 1985, Ser. No. 702,846

Claims priority, application Japan, May 29, 1981, 56-077624[U]

Int. Cl.[4] G11B *5/55*

U.S. Cl. 360—106 4 Claims



1. A rotary head assembly for use in a tape recording/reproducing apparatus, comprising,

a head base adapted to be advanced for recording and reproducing operations,

a drum holder affixed to said head base and having a cylindrical bore formed therein,

a head carrying drum rotatably received in said cylindrical bore in said drum holder and carrying at a first axial end a recording/reproducing head, and at a second axial end a gear substantially coaxially fixed thereto,

a sector gear pivotally mounted on said drum holder and arranged to mesh with said gear,

a pair of spaced stops on said sector gear at circumferentially opposite ends thereof,

a first engaging pin on said sector gear between said spaced stops,

a slide member mounted on said head base for sliding movement lateral with respect to an axial direction of the head carrying drum, said slide member having a cut-out portion through which said first engaging pin projects,

a second engaging pin on said slide member,

a pair of inclined tracks formed on opposite sides of said cut-out portion such that said tracks extend between said spaced stops and said tracks can each abut a respective stop, and

a spring extended between said first engaging pin and said second engaging pin, whereby a sliding movement of the slide member in response to a reversal of the recording/reproducing operation is transmitted to said sector gear, to pivot the sector gear, by abutment of a track with its respective stop and by said spring, so as to effect substantially a 180° rotation of said head carrying drum in said drum holder.

4,600,957

GLASS-BONDED MAGNETIC HEAD HAVING DIFFUSION BARRIERS

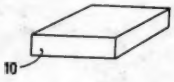
Johannes P. M. Damen; Klaas Prijs; Cornelis H. M. Witmer, and Gijsbertus de With, all of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,287

Claims priority, application Netherlands, May 19, 1982, 8202059

Int. Cl.[4] G11B *5/251*

U.S. Cl. 360—120 23 Claims



1. A magnetic head, comprising:

a magnetic core including two magnetic core parts having gap-bounding faces forming a transducing gap therebetween;

a non-magnetizable bonding material disposed in the transducing gap; and

a diffusion barrier provided between each gap-bounding face and the non-magnetizable bonding material;

characterized in that each diffusion barrier includes a first layer consisting essentially of silicon oxide provided on the respective gap-bounding face, and a second layer consisting essentially of silicon nitride provided on the first layer.

4,600,958

THIN-FILM MULTITRACK MAGNETIC HEAD OF HIGH TRACK DENSITY

Kurt Hurst; Kurt Neuffer, and Karl-Franz Reinhart, all of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,643

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204184

Int. Cl.[4] G11B *5/17, 5/147, 5/29*

U.S. Cl. 360—123 11 Claims

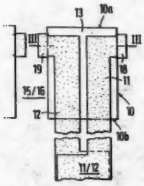
1. Thin-film magnetic head suitable for multitrack magnetic recording of digial signals and comprising:

superposed first (14) and second (13) magnetic layers to-

gether forming a magnetic yoke, being superposed in contact with each other in a first region and having a gap between them in a second region adjacent to said first region;

an interposed conductor path (17) passing between said first and second magnetic layers in said gap in said second region, in a direction substantially parallel to the boundary between said first and second regions;

connecting lead paths (11,12) disposed as side-by-side layers spaced apart from each other on the face of said second



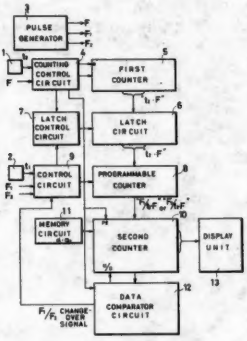
magnetic layer (13) opposite the face thereof which faces said first magnetic layer and extending over both said first and second regions of said yoke, leading away from said second region of said yoke towards and across said first region thereof, and

connecting conducting path elements (18, 19) at opposite sides of said second region of said yoke connecting the respective ends of said interposed conductor path (17) to said respective connecting lead paths (11,12) and running across opposite lateral edges of said second magnetic layer.

4,600,959
TAPE MEASURING METHOD

Shinichi Akita, Tokyo, Japan, assignor to Nippon Precision Circuits Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,531
Claims priority, application Japan, Mar. 3, 1982, 57-33703
Int. Cl.⁴ G11B *15/18, 27/10*
U.S. Cl. 360—137 **1 Claim**



1. A method for measuring a running tape being transferred from a rotating supply reel to a rotating takeup reel, comprising the steps of:

approximately a plurality of straight lines to a characteristic curve indicative of a correlation between the ratio of the rotational periods of said supply and takeup reels and a remaining time or an elapsed time for the running tape;

generating clock pulses of a first frequency and other clock pulses having a plurality of frequencies, said first and respective ones of said plurality of frequencies having ratios corresponding to respective slopes of said plurality of straight lines;

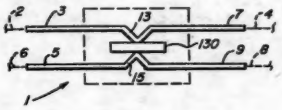
generating signals indicative of the rotational periods of said supply and takeup reels; and

measuring the remaining time or the elapsed time for the running tape by counting the product of said ratio of the rotational periods and the slopes of said straight lines by using said clock pulses and said signals.

4,600,960
FOUR TERMINAL PULSE SUPPRESSOR

O. Melville Clark, Tempe, Ariz., assignor to General Semiconductor Industries, Inc., Tempe, Ariz.

Continuation of Ser. No. 321,465, Nov. 16, 1981, abandoned, which is a continuation of Ser. No. 75,961, Sep. 17, 1979, Pat. No. 4,325,097. This application Oct. 16, 1984, Ser. No. 661,280
The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.
Int. Cl.⁴ H02H *9/04*
U.S. Cl. 361—56 **4 Claims**



1. A surge suppressor for limiting high speed, high voltage power surges, including electrostatic discharges, conducted between first and second electrical lines, said first and second electrical lines each including a first section and a separate second section, said surge suppressor comprising om combination:

(a) a package, said package having a cavity therein;

(b) a thin, semiconductor junction pulse suppressor disposed in said package, said semiconductor junction pulse suppressor having first and second parallel opposed flat major surfaces with first and second electrodes respectively thereon, said first electrode including a first flat contact area, said second electrode including a second flat contact area, said semiconductor junction pulse suppressor having a clamping voltage;

(c) first and second terminals located outside of said package;

(d) a first metal conductor for conducting substantially all line current flowing through said first line, said first metal conductor extending entirely through the interior of said package, said first metal conductor having a first intermediate portion located inside said package, said first metal conductor having opposed end portions electrically connected to said first and second terminals, respectively;

(e) means for attaching an area of said first intermediate portion directly to said first flat contact area of said first electrode so said line current flowing through said first electrical line all flows along the entire length of said first flat contact area adjacent to and sufficiently closely to said first flat contact area to eliminate substantially all inductance between said first electrode and said first electrical line;

(f) third and fourth terminals located outside of said package;

(g) a second metal conductor for conducting substantially all line current flowing through said second electrical line, said second metal conductor extending through the interior of said package, said second metal conductor having a second intermediate portion located inside said package, said second metal conductor having opposed end portions electrically connected to said third and fourth terminals, respectively; and

(h) means for attaching an area of said second intermediate portion directly to said second flat contact area so said line current flowing through said second electrical line all

flows along the entire length of said second flat contact area adjacent to and sufficiently closely to said second flat contact area to eliminate substantially all inductance between said second electrode and said second electrical line so that said semiconductor junction pulse suppressor can clamp the voltage between said first and second electrical lines to a level close to said clamping voltage;

said surge suppressor being inserted between said first and second sections of said first line and between said first and second sections of said second electrical line by connecting said first terminal to said first section of said first electrical line, said second terminal to said second section of said first electrical line, said third terminal to said first section of said second electrical line, and said fourth terminal to said second section of said second electrical line, and effectively suppressing said electrostatic discharges.

4,600,961

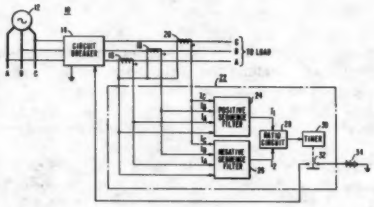
PROTECTIVE RELAY APPARATUS FOR DETECTING HIGH-IMPEDANCE GROUND FAULTS

Martin T. Bishop, Wilkins, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1983, Ser. No. 528,354

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—76 **4 Claims**



1. A protective relay for detecting high impedance broken conductor faults on a three-phase electrical power distribution system with phase A, B, and C conductors, said protective relay comprising:

first means for providing a first signal representative of the positive sequence current flowing in the electrical power distribution system;

second means for providing a second signal representative of the negative sequence current flowing in the electrical power distribution system; and

third means responsive to said first and second signals for calculating the ratio of the negative sequence current to the positive sequence current and for indicating the occurrence of a high-impedance fault when the ratio exceeds a predetermined value.

4,600,962

APPARATUS FOR MONITORING AND PROTECTING A DEVICE AGAINST A PLURALITY OF FAULT CONDITIONS

James C. Bliehall, Santa Rosa, Calif., assignor to Sentec Inc., Santa Rosa, Calif.

Filed Feb. 3, 1983, Ser. No. 463,492

Int. Cl.[4] H02H *3/26*

U.S. Cl. 361—77 **21 Claims**

1. A system for protecting a computer being supplied with three-phase power, comprising:

(a) means for monitoring and reacting to a power supply fault condition, including

(i) means for detecting loss of power or phase rotation of the three-phase power; and

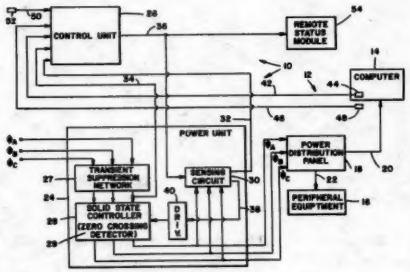
(ii) means for generating a phase fault control signal in response to the power loss or phase rotation;

(b) means for monitoring and reacting to an overtemperature fault condition, including

(i) means for detecting the temperature at the computer; and

(ii) means for generating a reset control signal at power-up of the computer independent of the temperature at the computer;

(c) means for monitoring and reacting to an unauthorized access fault condition, including



(i) means for producing a delayed power off control signal in response to the unauthorized access;

(ii) means for arming said producing means; and

(iii) means for testing said arming and producing means prior to each arming to ensure the operativeness of said arming and producing means; and

(d) means for driving off the supply of power to the computer in response to the phase fault control signal, the reset control signal and the delayed power off control signal.

4,600,963

CIRCUIT ARRANGEMENT TO PROTECT A SEMI-CONDUCTOR SWITCH WHICH CAN BE ACTIVATED WITHOUT CONTACT (REMOTELY)

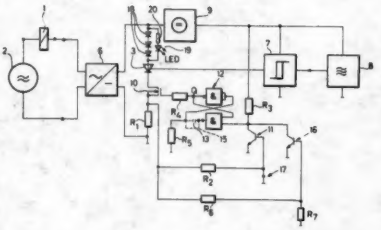
Wolfgang Hertrich, Aichtal, and Volker Fritsch, Stuttgart, both of Fed. Rep. of Germany, assignors to Euchner & Co., Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,609

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1983, 3302864

Int. Cl.[4] H02H *3/08*

U.S. Cl. 361—101 **7 Claims**



1. A circuit arrangement used in protecting against the overloading of a remotely controllable semiconductor switch which closes or interrupts an alternating current circuit, said circuit arrangement being connected to the direct current output of rectifier means, the input of said rectifier means being connected in the alternating current circuit, said circuit arrangement including said semi-conductor switch, a resistor functioning as a current sensing means and a transistor functioning as a current control means connected in series to the

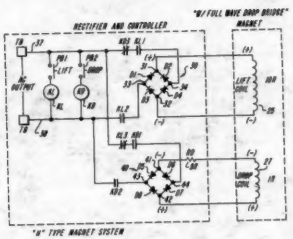
direct current output of said rectifier means and switch control circuit means connected to said current control means, said switch control circuit means including a control element which determines the condition of the current control means based on the voltage drop at the current sensing means, wherein the switch control circuit means (14) includes a flip-flop (12) which produces the control signals for the current control means, and a capacitor (17) is connected to a second resistor (R_2) to form an RC element connected in parallel with the current sensing means.

4,600,964

LIFTING MAGNET SYSTEM

Roger B. Ela, Spencer, and Paul H. Guerin, Clinton, both of Mass., assignors to Walker Magnetics Group, Inc., Worcester, Mass.

Filed Feb. 25, 1985, Ser. No. 705,014
Int. Cl.[4] H01F 7/20
U.S. Cl. 361—144 **3 Claims**



1. A lifting magnet system comprising:
a core of magnetically permeable material providing at least a pair of exposed pole faces for engaging a load;
a first coil linking said core for selectively magnetizing said core to lift a load;
a pair of a.c. supply leads
a first rectifier means having a.c. input terminals and d.c. output terminals, the d.c. output terminals being directly connected to said first coil;
a second coil linking said core for selectively demagnetizing said core to release a load;
a second rectifier means having a.c. input terminals and d.c. output terminals, the d.c. output terminals being directly connected to said second coil;
current switching means operative in a first state for connecting said a.c. supply leads to the input terminals of said first rectifier means and operative in a second state for connecting said a.c. supply leads to the input terminals of said second rectifier means, whereby lifting and releasing of a load involve switching of a.c. power only.

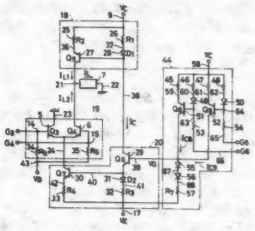
4,600,965

CURRENT DRIVING CIRCUIT

Naoki Sato, Hachioji; Yoshihisa Kamo, Kokubunji; Yasuhiro Katoh, Nishitama; Kazuhiro Momata, Chigasaki, and Shinichi Arai, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,711
Claims priority, application Japan, Feb. 23, 1983, 58-28967
Int. Cl.[4] G05F 3/22; H01H 47/32
U.S. Cl. 361—153 **17 Claims**

1. In a current driving circuit which supplies a two-terminal load with current to be inverted in accordance with input information; a current driving circuit characterized by comprising a load whose one-side terminal has its potential fixed to a predetermined value, first means to supply a non-fixed side terminal of said load with a direct current, and second means to supply said non-fixed side terminal with a current having a value double that of the direct current and a polarity opposite



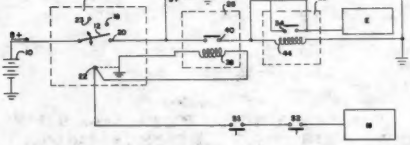
to that of said direct current, while switching it in accordance with input information.

4,600,966

IGNITION CONTROL SYSTEM

George R. Mueller, Union Grove, and Thomas W. Huitema, Racine, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 6, 1984, Ser. No. 617,952
Int. Cl.[4] H01H 47/22
U.S. Cl. 361—166 **2 Claims**



1. An ignition control system for a material handling implement comprising:
a plurality of operatively connected control switches, including a first load control switch, a second interlock control switch, and a third control switch which controls an associated electrical device;
ignition switch means having a plurality of selectable positions arranged in a predetermined sequence for directing a master control signal to said control switches, said ignition switch means including a first off position, a second on position wherein said master control signal is directed only to said first load control switch, and a third cranking position wherein said master control signal is further directed to said second interlock control switch whereby energization thereof directs said master control signal to said third control switch for operation of said associated electrical device, said selectable positions being arranged in a predetermined sequence terminating in said cranking position;
means operatively connecting said third cranking position of said ignition switch means with an associated starter motor, including neutral indicator switch means for preventing cranking of the starter motor unless a transmission of said implement is in a neutral condition; and
means for directing said master control signal for actuating said associated electrical device only upon completion of movement of said ignition switch means through said predetermined sequence, including means for maintaining actuation of said third control switch until said ignition switch means is moved to said off position, said maintain-

ing means comprising latch circuit means operatively associated with said third control switch to allow energization of said third control switch independently of closing of said second interlock control switch to maintain actuation of said third control switch until movement of said ignition switch means to said off position.

4,600,967

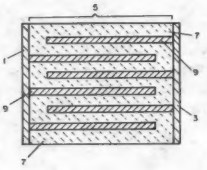
CERAMIC COMPOSITIONS AND DEVICES

Hung C. Ling, West Windsor Township, Mercer County, and Man F. Yan, Berkeley Heights, both of N.J., assignors to AT&T Technologies, Inc., Berkeley Heights and Bell Telephone Laboratories, Inc., Murray Hill, both of, N.J.

Continuation of Ser. No. 642,327, Aug. 20, 1984, abandoned. This application Oct. 21, 1985, Ser. No. 788,527

Int. Cl.[4] H01G *4/10*; C04B *35/00*

U.S. Cl. 361—321 **15 Claims**



15. A ceramic capacitor comprising a plurality of spaced electrodes and a dielectric material therebetween, said dielectric material represented by the formula

$$(1-y)Pb(Zn_xNb_{1-x})O_{3.5-1.5x}\text{-}yPbTiO_3$$

wherein x is from 0.3 to 0.4 and y is from 0 to less than 0.1.

4,600,968

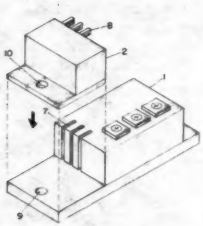
SEMICONDUCTOR DEVICE PACKAGE HAVING REGIONS OF DIFFERENT THERMAL PROPERTIES

Tsuneto Sekiya; Osamu Matsuura, and Shooichi Huruhata, all of Matsumoto, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 13, 1984, Ser. No. 670,751

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—394 **1 Claim**



1. A semiconductive package comprising

a first case of a first resin having a relatively high heat resistance and including semiconductive elements tolerant of relatively high operating temperatures and free of components intolerant of an operating temperature in excess of a given temperature, and

a second case of a second resin having a relatively lower heat resistance and including semiconductive elements intolerant of operating temperatures in excess of the given temperature,

the first case including a first set of terminals for interconnecting its components with the components in the second case,

the second case including a second set of terminals for interconnecting its components with the components in the first case,

one of two sets of terminals projecting from its case,

the other of the two sets being in recessed means in its case,

the projecting terminals removably merging with the terminals in the recessed means, electrically interconnecting the two sets of terminals and merging the two cases together to form an intimate interface between the two cases at the merger.

4,600,969

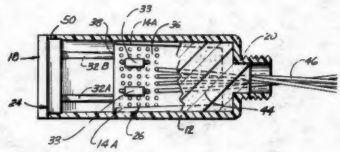
PROTECTIVE APPARATUS FOR ENCAPSULATING ELECTRICAL CIRCUITS

Max S. Hendrickson, 1167 N. Shore Trail, Forest Lake, Minn. 55025

Filed Jul. 6, 1984, Ser. No. 628,392

Int. Cl.[4] H05K *1/14*

U.S. Cl. 361—395 **12 Claims**



1. Encapsulating means for protecting an electrical circuit, the electrical circuit comprising a carrier and a plurality of discrete electrical components supported by the carrier and connected electrically to each other and to external electrical lead lines, the encapsulating means comprising:

a walled container means having a first opening in a first wall and a second opening in an oppositely disposed second wall, the container means further comprising internal support means for receiving and positioning the carrier in a predetermined relationship to the container means, with the lead lines extending out of the container means through the first opening;

cap means for completely closing the second opening, the cap means including at least one arm means projecting into the container means when the cap means is in closing relationship to the second opening, to positively fixedly position the carrier in the predetermined relationship;

means for holding the cap means in closed relationship with respect to the second opening; and

potting means introduced into the container means interior to inextricably encompass the fixedly positioned electrical circuit and arm means to permanently fix and seal the electrical circuit within the container means, wherein the potting means is applied as a fluid and hardens rigidly.

4,600,970

LEADLESS CHIP CARRIERS HAVING SELF-ALIGNING MOUNTING PADS

John A. Bauer, Medford, N.J., assignor to RCA Corporation, Princeton, N.J.

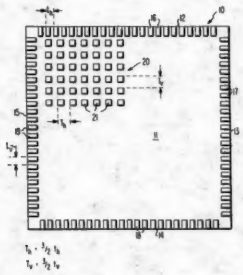
Filed May 29, 1984, Ser. No. 614,661

Int. Cl.[4] H05K *1/11*

U.S. Cl. 361—403 **8 Claims**

1. In a surface mounted chip carrier having a mounting surface having an outer periphery and an inner portion spaced from said outer periphery, said package having a plurality of solderable peripheral pads disposed on said mounting surface along the periphery thereof, a plurality of solderable interior pads disposed in spaced relation on said inner portion thereof,

and said peripheral pads having widths and spacings parallel to a first end of said mounting surface in accordance with a first predetermined period, the improvement comprising:



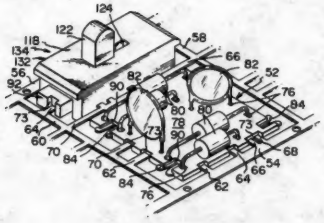
said interior pads adjacent said first end of said mounting surface being positioned along said first end in accordance with a second period which is equal to three quarters of said first period multiplied by an integer greater than one.

4,600,971

LEAD FRAMES WITH DIELECTRIC HOUSINGS MOLDED THEREON

William H. Rose, and David T. Shaffer, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 11, 1984, Ser. No. 609,165
Int. Cl.[4] H05K *5/02*
U.S. Cl. 361—421 **7 Claims**



1. A lead frame assembly, comprising:

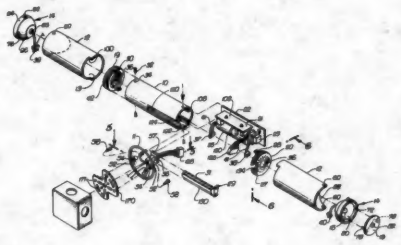
a continuous strip of lead frames stamped and formed from a strip of metal, each of said lead frames including spaced metal strips extending between carrier strips, and further including projections extending outwardly from said metal strips at spaced locations therealong; and at least first dielectric housing members secured onto said lead frames, each said first housing member having holes therethrough at the locations of free ends of said projections, and further having recesses disposed in a bottom surace thereof in communication with respective said holes, exposing said projections and enabling said projections to be urged downwardly therein, said free ends of said projections extending into said holes and engageable by electrical conductors inserted into respective said holes and deflectable downwardly thereby into respective said recesses, enabling said electrical conductors to be electrically and mechanically terminated in said holes by said free ends of said projections forcing said conductors against opposing wall portions of said holes.

4,600,972

EMERGENCY LIGHTING APPARATUS

Hazen L. MacIntyre, Los Angeles, Calif., assignor to Hazenlite Incorporated, Santa Monica, Calif.

Filed Aug. 23, 1984, Ser. No. 643,553
Int. Cl.[4] F21S *9/02;* **F21V** *19/04*
U.S. Cl. 362—20 **24 Claims**



1. Emergency lighting apparatus for attachment to a building structure and responsive to an operating condition of a utility line comprising:

housing support means for securing a housing to a structure;

housing means coupled to the housing support means for adjustably supporting a lamp head and encasing a lamp power supply and lamp actuator circuitry;

lamp head means for supplying a an adjustable lighted beam in response to sensing a loss of utility voltage, the lamp head means at least partially enclosed by and coupled to the housing means;

power supply means for powering the lamp head means in event of power outage independently of a utility voltage, the power supply means disposed within the housing means and electrically coupled to the lamp head means; and

circuit means for engaging the power supply means to actuate the lamp head means in response to an indication of loss of power, the circuit means disposed within the housing means; and in which

the housing means comprises tube means for supporting the power supply means and the circuit means, and envelope means disposed about the tube means for at least partially enclosing the tube means and supporting lamp head means adjacent opposing ends of the housing means, the envelope means providing a decorative appearance to the lighting fixture;

whereby an emergency lighting fixture is provided which retains its power supply and circuitry internal to its housing means which also at least partly encloses the lamp head means, supports the weight of the housing means by the housing support means, and allows light beam positioning.

4,600,973

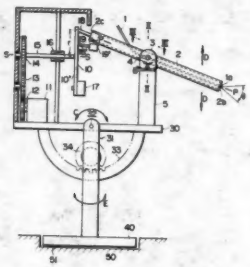
LIGHT SOURCE DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 8, 1985, Ser. No. 699,758
Claims priority, application Japan, Feb. 10, 1984, 59-23594
Int. Cl.[4] F21V *7/04*
U.S. Cl. 362—32 **12 Claims**

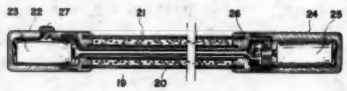
1. A light source device comprising a hollow cylinder, a support pin member for supporting said cylinder such that the cylinder can oscillate about a first axis perpendicular to a central axis of said cylinder, a pedestal member pivotably supporting said support pin member, a fixed supporting member for supporting said pedestal member such that the pedestal member can oscillate about a second axis intersecting with the central axis of said cylinder and intersecting said first axis, a driving mechanism for oscillating said cylinder around said

first axis and said second axis at a first end of said cylinder, and an optical conductor cable inserted into said cylinder at a place



near to said first axis, said cable extending within said cylinder from said place near to said first axis to an end portion of the cylinder opposite said first end.

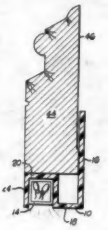
4,600,974
OPTICALLY DECORATED BATON
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and John W. Elias, 3018 4th St., Boulder, Colo. 80302
Filed Feb. 19, 1985, Ser. No. 702,688
Int. Cl.[4] A45B *3/02*
U.S. Cl. 362—102 **19 Claims**



1. An optically decorated baton comprising in combination: An outer transparent tube and a light-emitting cylinder disposed substantially coaxially within said outer transparent tube wherein said light-emitting cylinder is illuminated by at least one light bulb disposed at one extremity of said light-emitting cylinder and lighted by at least one electric battery, said combination of said outer transparent tube and said light-emitting cylinder sealed by a first closure means at one extremity and by a second closure means at the other extremity providing a sealed annular cylindrical space intermediate said outer transparent tube and said light-emitting cylinder wherein said annular cylindrical space includes a fluid medium including numerous light-reflecting particles of one or more colors.

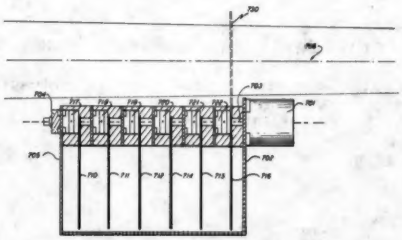
4,600,975
ARCHITECTURAL LIGHTING APPARATUS
James R. Roberts, 4501 N. Western, Oklahoma City, Okla. 73118
Filed Jan. 25, 1984, Ser. No. 573,639
Int. Cl.[4] F21S *1/14*
U.S. Cl. 362—147 **12 Claims**

1. An indirect lighting fixture comprising:
an elongated tubular light source having uniform cross-section;
a unitarily formed light housing structure having an anchor tab portion for flat affixure to associated planar structure, a spacer portion extending generally perpendicularly from one edge of said anchor tab portion, and a uniform elongated housing portion extending from said spacer portion distal from said anchor tab portion and receiving said light source securely therein, said housing portion defining an elongated volume open at generally one-quarter of the



circumphery with said open portion directed perpendicular to said spacer portion.

4,600,976
COLOR CHANGER MECHANISM
Michael Callahan, 201 W. 85th St., New York, N.Y. 10024
Filed Feb. 25, 1985, Ser. No. 704,750
Int. Cl.[4] F21V *9/00*
U.S. Cl. 362—277 **9 Claims**

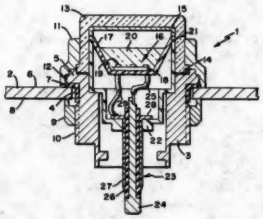


1. An improved color changer suitable for use with a light projector generating a beam, said beam having an elongated axis and suitable for performance lighting; said color changer comprising a plurality of parallel axially-spaced color filters, each supported for independent and continuous rotation about an effective pivot point between a position in said beam and out of said beam, the leading edge of each of said filters having an opposite and complementary shape to the trailing edge of each of said filters, means for rotating said filters, and means for maintaining the trailing edge of one filter in alignment with the leading edge of another filter during rotation of said means for rotating so that at least two of said plurality of filters are continuously rotated together in one direction to move one filter out and the other filter into said beam in such a manner that substantially no ray of light in said beam may pass through either both filters or neither.

4,600,977
SURVEILLANCE SIGNAL APPARATUS
Reinhold Barlian, 6990 Bad Mergentheim; Martin Fischle, Bad Mergentheim, and Karl-Heinz Lux, Weikersheim, all of Fed. Rep. of Germany, assignors to Reinhold Barlian, Bad Mergentheim, Fed. Rep. of Germany
Filed Sep. 13, 1984, Ser. No. 650,384
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333135
Int. Cl.[4] F21V *29/00*
U.S. Cl. 362—362 **19 Claims**

1. A surveillance apparatus comprising electrical terminal connectors;

a casing providing an explosion-proof space having attached the electrical terminal connectors;
an apparatus head disengageable attached to the casing;
a voltage limiter disposed in the casing;
a current limiter disposed in the casing;
a feed part;
a signalling part disposed in the apparatus head and supplied with electrical power from the terminals of the apparatus head, where the voltage limiter and the current limiter are electrically predisposed to the signalling part via the feed



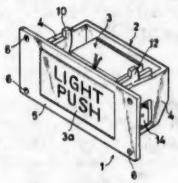
part and where the apparatus head with the signalling part and the feed part from the output of the voltage limiter and of the current limiter are provided as an explosion-proof self-safety unit; and
a printed circuit board disposed in the explosion-proof encapsulated space of the casing;
an electrical fuse disposed on the printed circuit board; connections provided between the feed part of the explosion-proof self safety unit and the printed circuit board in the explosion-proof space of the casing.

4,600,978

ILLUMINATOR

Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Nov. 26, 1984, Ser. No. 674,808
Claims priority, application Japan, Nov. 25, 1983, 58-181007[U]
Int. Cl.⁴ F21V *21/28*
U.S. Cl. 362—365 **6 Claims**



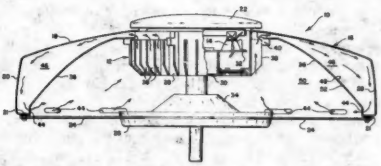
1. An illuminator, comprising in combination: an outer case provided with opposite lateral walls, opened on the front side, and provided with means capable of attaching said outer case to a framework, an illumination chamber having opposite lateral walls and pivotally disposed between said lateral walls of said outer case so as to be rotated between a closed position and an opened position relative to said outer case and provided with a lid adapted to close the opened front side of said outer case when in the closed position, a light source disposed inside said illumination chamber, a rotary damper provided with stopper means capable of retaining said illumination chamber normally in the closed position relative to said outer case and provided with means for driving said illumination chamber to its open position in response to release of said stopper means, and switch means including a switch member fixed to said outer case and switch actuating means on said illumination chamber adapted to put on said light source when said illumination chamber is rotated to the opened position thereof.

4,600,979

PASSIVE COOLING SYSTEM FOR A LUMINAIRE

Kenneth J. Fisher, and William R. Miller, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Oct. 2, 1985, Ser. No. 783,303
Int. Cl.⁴ B60Q *1/06*
U.S. Cl. 362—373 **16 Claims**



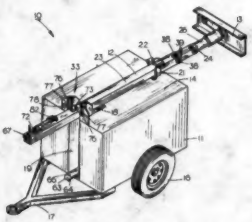
1. Apparatus for cooling an enclosure having a top, a bottom and sides extending therebetween and a heat generating means centrally disposed within said enclosure with one end thereof in proximity to said top of said enclosure and having a closed second end portion and side portions, comprising:
a. a series of fins affixed to the side portions of said heat generating means between said end portions thereof; and,
b. an inner annular wall disposed within said enclosure and extending at its upper end from a first point adjacent the radial, ends of said fins and near yet spaced from said top of said enclosure, so as to define an air flow passage between said side portion of said heat generating means, said fins and said upper end of said inner annular wall, to a second point at which its lower end is in proximity to the juncture between said sides and said bottom of said enclosure, said inner annular wall being provided with a series of slots disposed about the circumference thereof adjacent said second point.

4,600,980

PORTABLE LIGHT SUPPORT APPARATUS

Douglas L. Dahlgren, Holdrege, Nebr., assignor to Allmand Bros. Inc., Holdrege, Nebr.

Filed Jan. 25, 1985, Ser. No. 695,037
Int. Cl.⁴ F21V *21/22*
U.S. Cl. 362—385 **10 Claims**



1. A telescoping light support apparatus having a telescopic mast unit that can be selectively moved between a shortened position and an elongated position, comprising:
(a) a primary support member having a substantially hollow interior;
(b) a secondary support member having a substantially hollow interior and being insertable into and removable from said primary support member;

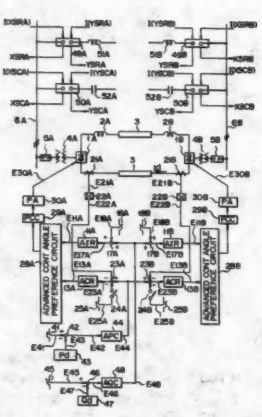
(c) a hydraulic cylinder mounting unit affixed at least partially within said primary support member;
(d) a second hydraulic cylinder slidably mounted about said hydraulic cylinder mounting unit;
(e) a first hydraulic cylinder slidably mounted about said second hydraulic cylinder;
(f) seal means for providing a fluid seal as between said first and second hydraulic cylinder and as between said first hydraulic cylinder and said hydraulic cylinder mounting unit;
(g) first interface means for operably affixing said secondary support member proximal its upper end to said hydraulic cylinder proximal its lower end during movement of said telescopic mast unit to said elongated position;
(h) second interface means for operably affixing said first support member proximal its upper end to said second support member proximal its lower end during movement of said telescopic mast unit to said elongated position to stop said movement; and
(i) a rotating light bar unit including a light bar rotatably affixed to said telescopic mast unit for supporting at least one electric light, and a rotating drive means operably affixed to said light bar for remotely allowing said light bar to be selectively rotated with respect to said telescopic mast unit, said rotating drive means including an actuator unit operably affixed to said light bar, a drive sleeve operably connected to said actuator unit and being selectively extendable therefrom, a guide shaft affixed to said light bar and having said drive sleeve slidably disposed thereabout, a mast sprocket operably affixed with respect to said telescopic mast unit, an idler sprocket operably affixed with respect to said light bar; and a chain operably engaged about said mast sprocket and idler sprocket and being affixed to said drive sleeve, such that movement of said drive sleeve by said actuator unit will cause said light bar to rotate with respect to said telescopic mast unit.

4,600,981

MARGIN ANGLE RESPONSIVE METHOD AND APPARATUS FOR CONTROLLING REACTIVE POWER IN A HVDC SYSTEM

Takami Sakai, and Koji Imai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1985, Ser. No. 724,919
Claims priority, application Japan, May 8, 1984, 59-91223
Int. Cl.[4] H02J *3/36*
U.S. Cl. 363—35 **10 Claims**



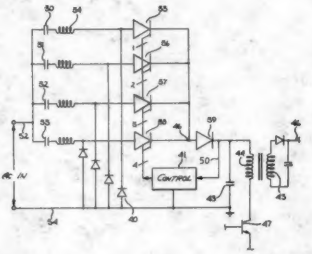
1. A control method of phase modifying equipment which is adapted to a DC power transmission system, wherein reactive power of an AC line coupled to the DC power transmission system is controlled in accordance with a margin angle, said control method comprising the steps of:
(a) when said margin angle reaches a given minimum margin angle, a phase-advancing reactance element being disconnected from said AC line; and
(b) when said margin angle exceeds said given minimum margin angle by a predetermined value, said phase-advancing reactance element being connected to said AC line.

4,600,982

LOW POWER CONSUMING AC TO DC CONVERTER

Martin H. Graham, Berkeley, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Division of Ser. No. 582,612, Feb. 22, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 742,893
Int. Cl.[4] H02M *7/17*
U.S. Cl. 363—61 **4 Claims**



1. An electrical circuit for receiving an AC potential and providing a regulated DC potential to a load comprising:
a plurality of paths each including a capacitor and a silicon controlled rectifier (SCR), said paths being coupled to said AC potential;
a filter capacitor coupled to said paths to filter the DC current from said SCRs; and,
control means for controlling the firing of said SCRs, coupled to the control leads of said SCRs;
whereby by selectively controlling the ones of the SCRs which are turned on, the DC potential at said filter capacitor can be regulated.

4,600,983

DIGITAL CURRENT REGULATOR CIRCUIT FOR CONTROL OF BIDIRECTIONAL CURRENT FLOW THROUGH A LOAD

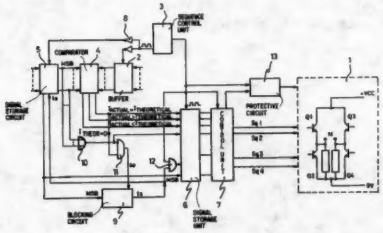
Johann Petsch, Anzinger Strasse 30, D-8011 Poing, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,218
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147731
Int. Cl.[4] H02P *13/32*
U.S. Cl. 363—63 **8 Claims**

7. A digital current regulator circuit comprising:
a transistor bridge circuit arranged for a multiquadrant operation,
means for deriving a binary actual value code representative of the current through a load connected at the output of the bridge circuit,
means for generating a theoretical value code representative of the desired current flow in said load,
a digital comparator for comparing the actual value code and the theoretical value code and producing output signals representing the result of such comparison,
a control unit for the time-discrete unipolar control of said

bridge transistors in accordance with a central timing signal,

means for blocking the bridge circuit when the polarity of the theoretical value code changes, and



means for terminating the blockage of the bridge circuit as soon as the load current reaches a desired predetermined value.

4,600,984

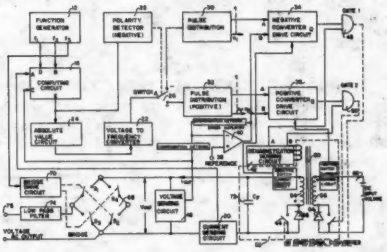
TWO QUADRANT POWER MODULATOR

Itzchak Cohen, 1171 Carll's Straight Path, Dix Hills, N.Y. 11746

Continuation of Ser. No. 585,502, Mar. 2, 1984. This application Sep. 9, 1985, Ser. No. 773,626

Int. Cl.[4] H02M *7/44*

U.S. Cl. 363—97 **4 Claims**



1. A two quadrant power modulator comprising in combination:

a. at least one bi-directional flyback converter capable of transferring energy from a source in its primary side to a load in its secondary side and vice versa;

b. a positive drive circuit, which when activated by a pulse applied to its input, will turn on the primary side switching element of said bi-directional flyback converter and will then turn primary side switching element off when the current in primary side switching element reaches a predetermined value, thereby causing the transfer of a fixed amount of energy, E_o, per conduction period to be transferred from the said source to said load;

c. a negative drive circuit, which when activated by a pulse applied to its input, will turn on the secondary side switching element of said bi-directional flyback converter and will then turn said secondary side switching element off, when the current in said secondary side switching element reaches a predetermined value, thereby causing the transfer of a fixed amount of energy, E_o, per conduction period to be transferred from the said load to said source;

d. a voltage to frequency converter that generates a train of pulses whose frequency is proportional to the voltage applied to the input of the said voltage to frequency converter;

e. a single pole double throw switch, activated by a polarity detector that directs the pulses generated by said voltage to frequency converter to the input of the said positive drive circuit when the input voltage to said polarity detector is positive and to the input of the said negative drive circuit when the input voltage to said polarity detector is negative;

f. an absolute value circuit whose output voltage equals the absolute value of its input voltage and whose output constitutes the input to the said voltage to frequency converter; and

g. a computing circuit, characterized by four inputs A, B, C, D, and one output E, programmed to perform the operation:

$$E=((A+B)/C)*D$$

and whose output E constitutes the inputs to the said polarity detector and the said absolute value circuit.

4,600,985

NUMERICAL CONTROL METHOD AND APPARATUS THEREFOR

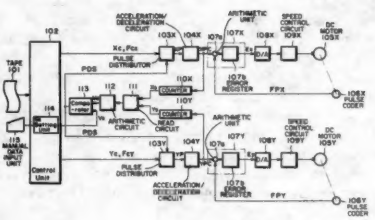
Ryoichiro Nozawa, Tokyo; Hideaki Kawamura; Takao Sasaki, both of Hachioji, and Satoru Hirose, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed May 31, 1983, Ser. No. 499,377

Claims priority, application Japan, Jun. 1, 1982, 57-93500

Int. Cl.[4] G05B *19/405*

U.S. Cl. 364—169 **9 Claims**



1. A numerical control method including performing machining control based on first numerical control command data in a first tool control block, reading second numerical control command data in a second tool control block during the machining control performed based on the first numerical control command data, the first and second tool control blocks preceding and following, respectively, a corner on a tool path, preprocessing the second numerical control command data in the second tool control block concurrently with the machining control based on the first numerical control command data in the first tool control block, and performing machining control based on the second numerical control command data in the second tool control block, when the machining control based on the first numerical control command data in the first tool control block ends, said method comprising the steps of:

(a) decelerating a tool feed speed control when a transition is made to the second tool based on the first numerical control command data in the first tool control block;

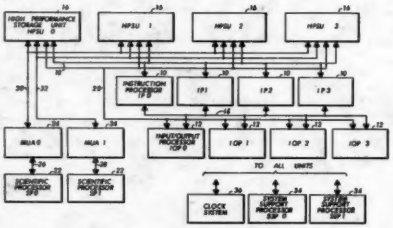
(b) sensing when the feed speed is reduced to a prescribed speed greater than zero; and

(c) starting interpolation for the second tool control block, when the prescribed speed is sensed in step (b), by accelerating the tool feed speed based on the second numerical control command data in the second tool control block.

4,600,986
PIPELINED SPLIT STACK WITH HIGH PERFORMANCE INTERLEAVED DECODE

James H. Scheuneman, St. Paul, and Wayne A. Michaelson, Lake Elmo, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 2, 1984, Ser. No. 596,215
Int. Cl.[4] G06F *9/38, 9/40, 12/00*
U.S. Cl. 364—200 13 Claims



1. For use in a high performance storage unit capable of pipeline interaction with multiple requesting units, and having a plurality of addressable memory banks, memory bank access control circuitry for decoding, prioritizing, and issuing bank acknowledge signals in response to applied bank selection signals, a clock signals distributed in the unit, and capable of pipelining up to R requests for access to the memory banks without having received an acknowledge signal indicating that an access has been completed, a high performance virtual first-in first-out pipelined data stack structure comprising:

request receiving means for receiving request in signals from an associated requester;

bank acknowledge receiving means for receiving bank acknowledge signals;

interface means for receiving data words to be written in memory banks at addressable locations;

split control stack means including a first set of ½R split stack register means and a second set of ½R split stack register means, said first and second sets of split stack register means for alternately storing sequential bank selection signals and request in signals between said first set and said second set;

split control stack write control means responsively coupled to said request in receiving means for causing said bank selection signals to be alternately stored in successively addressed ones of said split stack register means in response to successive ones of said request in signals;

split control stack read control means coupled to said bank acknowledge receiving means for causing alternate readout from successively addressed ones of said split stack register means.

4,600,987
MONITORING CIRCUIT FOR AN ELECTRONIC POSTAGE METER

Easwaran C. N. Nambudiri, Hicksville, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

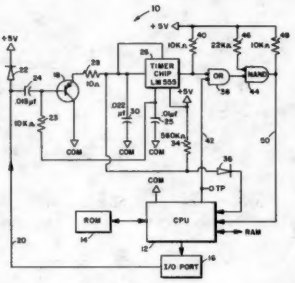
Filed Dec. 8, 1982, Ser. No. 447,750
Int. Cl.[4] G06F *9/00, 11/00*
U.S. Cl. 364—200 9 Claims

1. A monitoring circuit for an electronic postage meter operating under control of a programmed microprocessor, including:

a transistor switch for receiving an output signal from the programmed microprocessor and generating an output signal in response thereto;

timer means electrically coupled to said transistor switch for generating an output pulse in the absence of a signal from said transistor switch within a predetermined time interval;

logic gate means electrically coupled to said timer means for holding its output in a first logical state in the absence of a signal from said timer means and capable of changing its output to a seacond logical state in the presence of an output signal from said timer means;



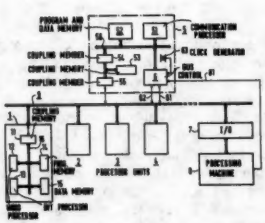
said logic gate means includes an OR gate and a NAND gate, said OR gate having one input connected to said timer means and its output connected to the input of said NAND gate, the output of said NAND gate being connected to the microprocessor; and

means coupled as another input to said OR gate for holding the output of said NAND gate in a desired logical state during testing.

4,600,988
MEMORY-PROGRAMMABLE CONTROL

Gautan Tendulkar, Erlangen; Claus Becker, Ötigheim, and Wolfgang Richter, Birkweiler, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,771
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236302
Int. Cl.[4] G06F *13/22;* G05B *19/18*
U.S. Cl. 364—200 2 Claims



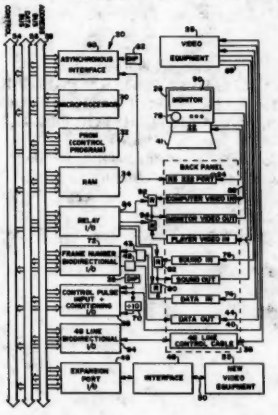
1. A memory-programmable controller for controlling the process cycle of a processing machine operating a process, the controller comprising a multiprocessor system having a master communications processor unit and a plurality of individual processor units, each processor unit including a coupling memory, each coupling memory coupling a respective processor unit to a common system bus, and further comprising input-/output means coupled to said common system bus for transferring signals from the common system bus to and from the processing machine, said communications processor unit controlling the transfer of signals between the processor units and said processing machine, each processor unit further comprising subprogram memory means and data memory means

which can be accessed directly by said communications processor unit, said communications processor unit comprising means for controlling the access of said processor units to the common system bus, said means for controlling comprising bus control unit means for providing access to the common system bus by only one of the processor units at a time, said bus control unit means comprising memory means having stored therein the access sequence of said processor units and the respective access duration times of the processor units to the common system bus, said access duration times comprising selectable integral multiples of a basic clock period, and further comprising means responsive to said stored access sequence and duration times for scanning a bus cycle, said bus cycle comprising a predetermined number of basic clock periods, and means for generating bus release signals, said bus release signals being coupled to respective ones of said processor units for providing access by said respective processor units to the common system bus during said bus cycle and further comprising means for monitoring the number of times the common system bus has been accessed by each processor unit within a predetermined number of bus release signals, said monitoring means comprising counter means for counting out respective predetermined periods of time for each of said processor units.

4,600,989
UNIVERSAL COMPUTER, RECORDED VIDEO INTERFACE

Marc D. Schwartz, New Haven, and Christopher B. Sura, Derby, both of Conn., assignors to CAVRI Systems, Inc., New Haven, Conn.

Continuation of Ser. No. 354,460, Mar. 3, 1982, abandoned. This application Jul. 1, 1985, Ser. No. 751,035
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **29 Claims**



1. A universal computer, recorded video interface comprising:

A. an interface computer;

B. a computer to computer interface for connecting said interface computer to a host computer and for receiving from said host computer video control commands;

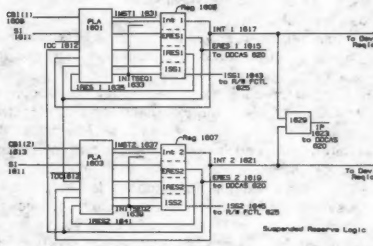
C. a computer to control cable interface for connecting said interface computer to a recorded video source, said cable interface providing a plurality of control lines for connection to said recorded video source; and

D. means connected to said interface computer for storing a table indicating to or from which of said control lines each of a plurality of recorded video source control signals is to be sent or received by said cable interface.

4,600,990
APPARATUS FOR SUSPENDING A RESERVE OPERATION IN A DISK DRIVE

Edward Gershenson, Worcester; Louis A. Lemone, Stow, and Salvatore Faletra, Framingham, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed May 16, 1983, Ser. No. 495,211
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **4 Claims**



1. In a disk drive connected to one controller of two controllers by means of one bus and to another controller of said two controllers by means of another said bus, means for suspending the effect of a reserve command received from said one controller on said one bus when said another controller has reserved said disk drive until said another controller provides a release command on said other bus and suspending the effect of said reserve command received from said another controller on said another bus when said one controller has reserved said disk drive until said one controller provides said release command on said one bus comprising:

(1) one external reserved state retention means, operatively connected to said one bus through one suspended reserve logic means, for retaining one external reserved state indicating whether said reserve command received from said one controller has been given effect, said one external reserved state retention means having an input for setting said one external reserved state and an output for outputting said one external reserved state;

(2) one internal reserved state retention means, operatively connected to said one bus through said one suspended reserve logic means, for retaining one internal reserved state indicating whether the effect of said reserve command received from said one controller has been suspended, said one internal reserved state retention means having an input for setting said one internal reserved state and an output for outputting said one internal reserved state;

(3) another external reserved state retention means, operatively connected to said another bus through another suspended reserve logic means, for retaining another external reserved state indicating that said reserve command received from said another controller has been given effect, said another internal reserved state retention means having an input for setting said another external reserved state and an output for outputting said another external reserved state;

(4) another internal reserved state retention means, operatively connected to said another bus through said another suspended reserve logic means, for retaining another internal reserved state indicating whether the effect of said reserve command received from said another controller has been suspended, said another internal reserved state retention means having an input for setting said one internal reserved state and an output for outputting said another external reserved state;

(5) said one suspended reserve logic means including

(a) inputs including

(i) command receiving inputs connected to said one bus

for receiving said reserve command and said release command;

(ii) a one internal reserved state receiving input connected to said output of said one internal reserved state retention means,

(iii) a one external reserved state receiving input connected to said output of said one external reserved state retention means, and

(iv) an another external reserved state receiving input connected to said output of said another external reserved state retention means and

(b) outputs including

(i) a one internal reserved state setting output connected to said input of said one internal state retention means and

(ii) a one external reserved state setting output connected to said input of said one external reserved state retention means; and

(6) said another suspended reserve logic means including

(a) inputs including

(i) command receiving inputs connected to said another bus for receiving said reserve command and said release command;

(ii) an another internal reserved state receiving input connected to said output of said another internal reserved state retention means,

(iii) an another external reserved state receiving input connected to said output of said another external reserved state retention means, and

(iv) a one external reserved state receiving input connected to said output of said one external reserved state rentention means and

(b) outputs including

(i) an another internal reserved state setting output connected to said input of said another internal reserved state retention means and

(ii) an another external reserved state setting output connected to said input of said another external reserved state retention means;

and wherein

said one suspended reserve logic means responds to said reserve command and said another external reserved state indicating that said reserve command received from said another controller has not been given effect by setting said one external reserved state retention means to indicate that said reserve command received from said one controller has been given effect;

said one suspended reserve logic means responds to said reserve command and said another external reserved state indicating that said reserve command received from said another controller has been given effect by setting said one internal reserved state retention means to indicate that the effect of said reserve command received from said one controller has been suspended;

said one suspended reserve logic means responds to said release command by setting said one external reserved state to indicate that said reserve command received from said one controller has not been given effect;

said one suspended reserve logic means responds to said another external reserved state indicating that said reserve command received from said another controller has not been given effect and said one internal reserved state indicating that the effect of said reserve command received from said one controller has been suspended by setting said one external reserved state to indicate that said reserve command received from said one controller has been given effect and said one internal reserved state to indicate that the effect of said reserve command received from said one controller has not been suspended;

said another suspended reserve logic means responds to said reserve command and said one external reserved state indicating that said reserve command received from said one controller has not been given effect by setting said another external reserved state retention means to indicate that said reserve command received from said another controller has been given effect;

said another suspended reserve logic means responds to said reserve command and said one external reserved state indicating that said reserve command received from said one controller has been given effect by setting said another internal reserved state retention means to indicate that the effect of said reserve command received from said another controller has been suspended;

said another suspended reserve logic means responds to said release command by setting said another external reserved state to indicate that said reserve command received from said another controller has not been given effect; and

said another suspended reserve logic means responds to said one external reserved state indicating that said reserve command received from said one controller has not been given effect and said another internal reserved state indicating that the effect of said reserve command received from said another controller has been suspended by setting said another external reserved state to indicate that said reserve command received from said one controller has been given effect and said another internal reserved state to indicate that the effect of said reserve command received from said another controller has not been suspended, whereby said one suspended reserve logic means reserves said disk drive for said one controller when said one internal reserved state retention means indicates that the effect of said reserve command received from said one controller has been suspended when said another controller provides said release command to said another suspended reserve logic means and said another suspended reserve logic means reserves said disk drive for said another controller when said another internal reserved state retention means indicates that the effect of said reserve command received from said another controller has been suspended when said one controller provides said release command to said one suspended reserve logic means.

4,600,991

INTEGRATED MICROPROGRAMMED DEVICE FOR CONTROLLING INFORMATION PROCESSING CYCLES, AND A METHOD FOR OPERATING THE SAME

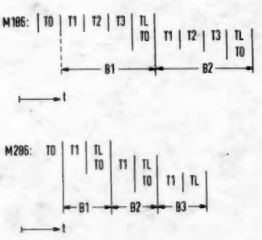
Franz Schönberger; Hans Stadlmeier; Reinhold Brunner, and Wolfgang Wagner, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,583

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241378

Int. Cl.[4] G06F *1/04*

U.S. Cl. 364—200 **21 Claims**



1. Integrated microprogrammed device for controlling information processing cycles, including T-states of a first type having no overlap with preceding nor succeeding T-states, the apparatus further comprising means for generating one or more T-states of a second type in dependence on preceding

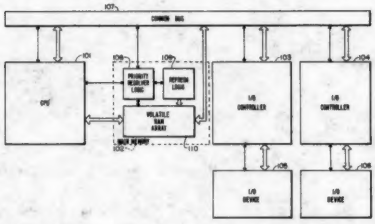
T-states and wherein each T-state of the second type is timingly overlapping at least one T-state of the first type.

4,600,992

PRIORITY RESOLVER WITH LOWEST PRIORITY LEVEL HAVING SHORTEST LOGIC PATH

Daniel A. Boudreau, and Edward R. Salas, both of Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 14, 1982, Ser. No. 449,703
Int. Cl.[4] G06F *9/46, 15/16*
U.S. Cl. 364—200 **15 Claims**



1. An apparatus for resolving priority requests between devices competing for access to a shared resource during a priority resolution cycle comprising:

A. a lowest priority level logic means associated with a first device having the lowest priority and comprising:

a. an ask means for receiving a request signal from said first device and indicating that the first device desires use of said shared resource,

b. a grant means coupled to receive an output from said ask means,

B. a highest priority level logic means associated with a second device having the highest priority and comprising:

a. an ask means for receiving a request signal from said second device indicating that the second device desires to use the shared resource,

b. a late request inhibit means coupled to receive an output from said ask means,

c. a grant means coupled to receive an output from said last request inhibit means,

C. a cycle initiate means coupled to receive an output from said lowest priority level grant means, and also coupled to receive an output from said highest priority level grant means to produce an initiate signal, wherein said initiate signal output by said cycle initiate means indicates that at least one of said devices is requesting use of said shared resource,

D. a delay means for producing a delayed initiate signal by delaying said initiate signal a sufficient amount of time to allow ones of said grant means to be set that are going to be set during a priority resolution cycle,

E. a lowest priority winner means coupled to receive said output from said lowest priority grant means and to receive said delayed initiate signal to produce a low win signal that indicates said first device has won use of said shared resource if no higher priority level grant means has been set once said delayed initiate signal is produced by asaid delay means, and

F. highest priority winner means coupled to receive said output from said highest priority grant means and to receive said delayed initiate signal for producing a high win signal indicating that said second device has won use of said shared resource if said highest priority grant means is set when said delayed initiate signal appears,

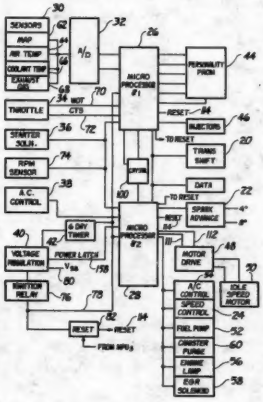
wherein said first device has the shortest path to said cycle initiate means and can initiate a priority resolution cycle quicker than said second device, and wherein said initiate signal is produced before a final winner of the shared resource is determined.

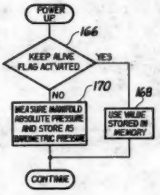
4,600,993

MEASURING BAROMETRIC PRESSURE WITH A MANIFOLD PRESSURE SENSOR IN A MICROPROCESSOR BASED ENGINE CONTROL SYSTEM

Michael A. Pauwels, Williamsburg, and Danny O. Wright, Grafton, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 27, 1983, Ser. No. 499,112
Int. Cl.[4] F02D *35/00, 41/26;* F02P *5/15*
U.S. Cl. 364—431.05 **7 Claims**





3. In a microprocessor based electronic engine control system for an internal combustion engine, a method for updating the stored ambient pressure signal by measuring the ambient barometric pressure during engine operation using a manifold pressure sensor, the method comprising the steps of:

generating timing signals indicating the rotational position of an engine member and including a signal indicating a predetermined rotational position in the rotation of said engine member;

generating a pressure signal from the manifold pressure sensor representing the pressure surrounding the sensor in response to said predetermined rotational position;

reading the value of ambient barometric pressure stored in the memory of the microprocessor;

comparing the value of the barometric pressure stored in the memory of the microprocessor and the value of said pressure signal;

increasing the value of the barometric pressure by one unit to generate a new barometric pressure value when the value of said pressure signal is greater than the value of the barometric pressure;

comparing the new barometric pressure value with a prede-

termined fixed constant representing the maximum barometric pressure; and

storing in the memory of the microprocessor either the new barometric pressure value if equal to or less than said fixed constant or the value of the maximum barometric pressure if the new barometric pressure value is greater than said fixed constant.

4,600,994

PHASE DIFFERENCE MEASURING APPARATUS

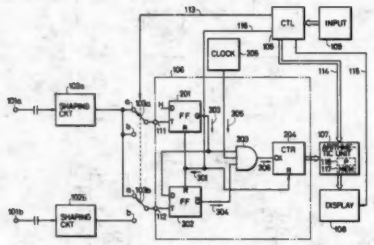
Mishio Hayashi, Saitama, Japan, assignor to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,986

Claims priority, application Japan, Oct. 6, 1982, 57-176901; Feb. 17, 1983, 58-26051

Int. Cl.[4] G01R 25/00

U.S. Cl. 364—484 18 Claims



1. Phase difference measuring apparatus for measuring the phase difference between first and second input signals of the same frequency, comprising:

first and second waveform shaping circuits for waveform-shaping the first and second input signals into respective first and second waveform-shaped signals;

a clock signal source for generating clock pulses;

a time interval measuring circuit provided with first and second input terminals and connected to the clock signal source, for counting the clock pulses from the clock signal source over the time interval occurring between corresponding edges of respective ones of said first and second waveform-shaped signals that are supplied to the first and second input terminals and to provide corresponding count values;

changeover switching means for switching the output of the waveform shaping circuits between a first connection state in which the output of the first waveform shaping circuit is connected to both of the first and second input terminals of the time interval measuring circuit, and a second connection state in which the outputs of said waveform shaping circuits are connected to respective ones of said first and second input terminals of the time interval measuring circuit;

operating means for calculating the period P of said first and second input signals, from each respective count value obtained from the time interval measuring circuit in the first connection state of the changeover switching means, and calculates a respective measured time difference Tk corresponding to said phase difference between said first and second waveform-shaped signals, from each respective count value obtained from the time interval measuring circuit in the second connection state of the changeover switching means, for calculating the phase difference betweeen said first and second input signals from said period P and each said measured time difference Tk, and for controlling the respective operations of said changeover switching means and said time interval measuring circuit.

4,600,995

METHOD FOR MANUFACTURING A CUSTOM-CIRCUIT LSI, AND A GATE ARRAY DEVICE

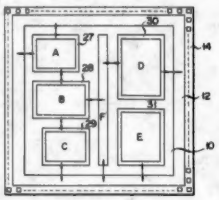
Tsuneo Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 565,001

Claims priority, application Japan, Dec. 27, 1982, 57-226969

Int. Cl.[4] G06F 15/46

U.S. Cl. 364—491 18 Claims



1. A method for manufacturing a custom-circuit LSI, comprising:

a first step of preparing a mask-programmable logic array device on which a total number of logic cells are formed;

a second step of interconnecting the logic cells formed in predetermined areas of the logic array device into a plurality of functional units, each including a predetermined number of interconnected logic cells which is less than the total number of logic cells and of a number that can be more easily manipulated by a CAD system; and

a third step of interconnecting said functional units to form the custom-circuit.

4,600,996

ARRANGEMENT FOR INSPECTING CIRCUIT PATTERNS DRAWN ON A MASK

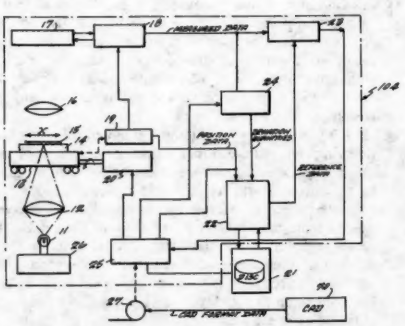
Yasunobu Kawauchi, Tokyo, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,511

Claims priority, application Japan, Sep. 28, 1982, 57-169377

Int. Cl.[4] G06F 15/46; B41B 41/00

U.S. Cl. 364—491 12 Claims



1. A system for inspecting a circuit pattern drawn on a mask comprising:

mask drawing apparatus means for drawing a circuit pattern on said mask;

memory means for storing pattern data used by said mask drawing apparatus means;

means for generating measured data corresponding to said circuit pattern drawn on said mask;

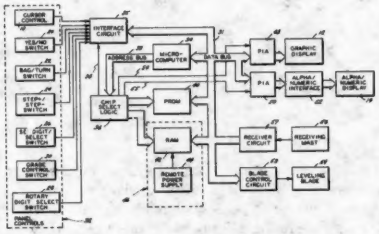
means for reading said pattern data from said memory means and generating reference data indicative thereof; and

means for comparing said measured data with said reference data and determining a correspondence therebetween, thereby determining whether the pattern on said mask corresponds to the pattern defined by said memory means and intended to be drawn on said mask.

4,600,997
SURVEYING SYSTEM

Gary L. Cain; Elvin K. Honey, both of Springfield, and Sidney B. Goren, Troy, all of Ohio, assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed May 9, 1983, Ser. No. 492,554
Int. Cl.[4] G01C *11/12*; G06F *15/20*
U.S. Cl. 364—505 **29 Claims**



1. In a system for surveying the contour of an area of land including a stationary transmitter for generating a rotating laser beam in a plane above the area of land to be surveyed, and a receiver movable about the area of land and responsive to the rotating laser beam for generating an elevation signal representing the elevation of the land at the receiver location relative to a predetermined reference level, a control circuit connected to receive the elevation signal from the receiver, said control circuit comprising:

input means for inputting a direction signal representing a predetermined side of the area of land;

means for generating grid signals representing a predetermined grid pattern having a plurality of grid points representing locations on the area of land at which an elevation reading is to be taken; and

means for storing said direction signal and the elevation signal of a selected one of said grid points when the receiver is located at the corresponding location on the area of land.

4,600,998
SYSTEM FOR THE NON-DESTRUCTIVE TESTING OF THE INTERNAL STRUCTURE OF OBJECTS

Jacques Huet, Palaiseau, France, assignor to Commissariat a l'Energie Atomique, Paris, France

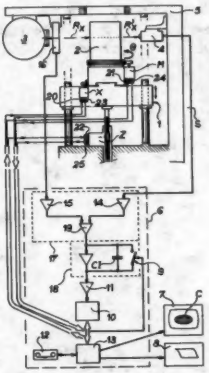
Filed Aug. 27, 1982, Ser. No. 412,143
Claims priority, application France, Sep. 10, 1981, 81 17148
Int. Cl.[4] G01N *23/02*; G01B *15/06*
U.S. Cl. 364—507 **4 Claims**

1. A system for the non-destructive testing of the internal structure of objects comprising a support for the objects to be tested and an assembly constituted by an X-ray generator able to emit an incident X-ray beam in the direction of the object and by means for the detection of the attenuated X-ray beam emanating from the object in the direction of the incident beam, said detection means being integral with the generator and supplying at least one signal, whose amplitude is proportional to the intensity of the attenuated beam, means for the control of the successive displacements of the support relative to a fixed reference mark and which comprise means for the linear displacement of the support parallel to the axis contained in a sectional plane P of the object and which is perpendicular to the incident beam, means for linearly displacing the support parallel to an axis perpendicular to the sectional plane, and means for rotating the support around the axis perpendicular to the sectional plane, said system also comprising means for processing the signals from the detection means, whereby the said processing means comprise:

(a) means for the amplification of the signals from the detection means;

(b) signal integration means connected to the amplification means, the integration means being synchronized with the successive displacements of the support in such a way that the integration time corresponds to the time interval separating two successive linear displacements of the support;

(c) an analog-digital converter connected to the integration means for supplying digital values corresponding respectively to the average amplitudes of the integrated signals



during the time interval separately from the successive displacements of the support;

(d) means for storing these digital values; and

(e) means for processing the stored digital values and for controlling, on the basis thereof, means for the display of each section of the object, wherein in the said system the means for amplifying the signals from the detection means comprise at least a first logarithmic amplifier receiving the output signal from the detection means, means located in the path of the incident beam of X-ray for obtaining a signal whose amplitude is proportional to the intensity of the beam of incident X-rays, a second logarithmic amplifier receiving the proportional signal, and an adder receiving the signals supplied by the first and second logarithmic amplifiers, whereby an output of the adder is connected to the integration means.

4,600,999
AUTOMATIC RUNNING WORK VEHICLE

Katsumi Ito, Osaka, and Jituo Ysohida, Izumi, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 20, 1983, Ser. No. 496,565
Claims priority, application Japan, Jul. 13, 1982, 57-121564
Int. Cl.[4] G05D *1/02*; G06F *15/50*
U.S. Cl. 364—513 **14 Claims**

1. A controller for controlling a work vehicle to automatically travel along a zig-zag path covering a work area, comprising:

orientation sensing means for producing directional signals indicating the direction of travel of a work vehicle;

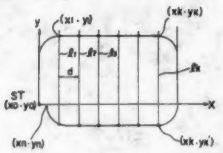
distance measuring means for producing distance signals indicating the distance travelled by said vehicle;

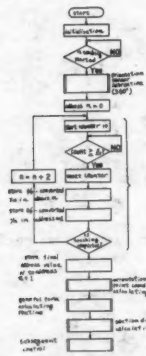
area outer periphery learning means, connected to receive said directional and distance signals, for calculating data

indicating the position of the outer periphery of a work area in response to the distance and directional signals produced while the vehicle is manually controlled to travel a peripheral path along the outer periphery of the work area by a human operator, said learning means calculating position-indicating data each time said vehicle travels a predetermined distance along said outer peripheral path;

automatic path determining means for producing, in response to the data calculated by said learning means, running data indicating a zig-zag path covering the entire portion of said work area within said peripheral path, said zig-zag path including a sequence of respective path segments; and

running control means for automatically controlling said vehicle to travel along said zig-zag path in response to said running data, said running control means controlling said vehicle to turn from a present path segment over which said vehicle is travelling onto the next path segment in said sequence when said distance signal indicates the vehicle has completely traversed the present path segment.





2. A method for automatically traversing a work area with a work vehicle comprising the steps of:

(1) sensing the instantaneous orientation of a work vehicle and the distance traveled by the vehicle;

(2) manually controlling the work vehicle to travel along a peripheral path delimiting the boundary of a work area;

(3) producing, at plural distance intervals along said peripheral path, indicia of the position of said work vehicle in response to said orientation and distance sensed by said sensing step (1);

(4) deriving, from said data produced by said producing step (3), indicia of a sequence of respective segments of an interior path covering substantially the entire portion of said work area within said peripheral path; and

(5) automatically controlling said work vehicle to travel along said segments of said interior path in sequence and for controlling said vehicle to turn from segment to segment in response to the distance sensed by said sensing step (1).

4,601,000

ELECTROHYDRAULIC CONTROL SYSTEM FOR A ROCKDRILL ASSEMBLY

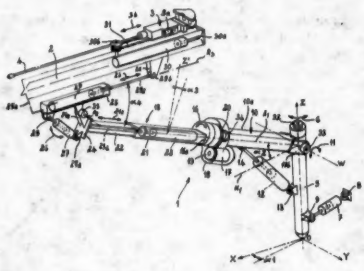
Roger Montabert, Lyons, France, assignor to Etablissements Montaberg, Societe Anonyme, Saint Priest, France

Filed Jan. 7, 1983, Ser. No. 456,385

Claims priority, application France, Jan. 11, 1982, 82 00648

Int. Cl.[4] B25J *11/00*

U.S. Cl. 364—513 **4 Claims**



1. In an electrohydraulic control system for a support arm assembly of a subterranean drilling machine for automatic drilling of a number of bores relatively shifted in a predetermined pattern forming a firing plan which comprises:

a base support angularly displaceable about a substantially upright first axis;

a first hydraulic operator connected to said base support for angularly displacing same about said first axis through an angle $\alpha 1$;

an arm pivotally mounted on said base support and swingable thereon about a second axis substantially perpendicular to said first axis, said arm having a longitudinal third axis substantially perpendicular to said second axis;

a second hydraulic operator connected to said arm for angularly displacing same about said second axis through an angle $\alpha 2$;

a support member on said arm angularly displaceable about said third axis;

a third hydraulic operator on said arm connected to said member for angularly displacing said member about said third axis through an angle $\alpha 3$;

a tool-guiding rail pivotally mounted on said member for tilting movement about a fourth axis substantially perpendicular to said third axis; and

a fourth hydraulic operator connected to said rail for tilting same about said fourth axis through an angle $\alpha 4$, the improvement wherein said system comprises in combination:

first, second, third and fourth sensors responsive respective to angular displacements $\alpha 1$, $\alpha 2$, $\alpha 3$ and $\alpha 4$ for generating respective electrical signals representing these angular displacements;

an electronic computer connected to each of said sensors individually for individually receiving said signals and processing same to provide:

(a) third and fourth output signals from said computer determining said angular displacements $\alpha 3$ and $\alpha 4$ to be generated by said third and fourth operators to maintain said rail parallel to itself upon positioning of said rail at a number of different locations for tool operations in response to first and second output signals corresponding to said angular displacements $\alpha 1$ and $\alpha 2$, and

(b) generating respective command signals Ve1, Ve2, Ve3 and Ve4 for each of said first, second, third and fourth operators upon said initiation of a programmed sequence of movements of said rail controlled by said computer for successive operations of a drilling tool on said rail in successive locations thereof;

programming means for selecting from a number of such programmed sequences a predetermined sequence for applying a predetermined plan of locations for successive tool operations to said computer in accordance with said firing plan;

respective electronic correction circuits between the respective outputs of said computer and each of said operators for controlling same by comparing signals representing said angular displacements $\alpha 1$, $\alpha 2$, $\alpha 3$ and $\alpha 4$ and thus said actual positions generated by said operators with command signals Ve1, Ve2, Ve3 and Ve4 from said computer, whereby each of said operators is controlled at least in part in consideration of forces on said assembly at each location, said third sensor producing electrical signals V3′ and V3″ which are respectively proportional to the sine and cosine of the angle of rotation $\alpha 3$ of said support member about about said third axis through a full 360°, said signals V3′ and V3″ being supplied to said electronic computer, said electronic computer being programmed to transform said signals V3′ and V3″ into a linear signal V3 as a function of the angle $\alpha 3$ over a full 360° excursion of said angle $\alpha 3$; and

means for applying said signal V3 to the electronic correction circuit of said third operator as the angle representing the actual position $\alpha 3$ generated by said third operator.

4,601,001

INVALIDATION ARRANGEMENT FOR INFORMATION STORED IN A MEMORY DURING A CERTAIN PERIOD OF TIME AND RADAR COMPRISING SUCH AN ARRANGEMENT

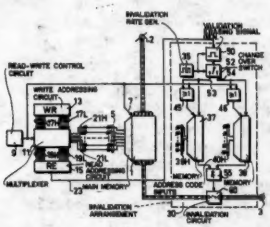
Jean-Yves M. Guiglini, Argenteuil, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1982, Ser. No. 375,148

Claims priority, application France, May 15, 1981, 81 09713

Int. Cl.⁴ G11C *15/00, 29/00;* G01S *7/04*

U.S. Cl. 364—518 **4 Claims**



1. In an apparatus for sequentially storing digital information including invalid information received during cyclically-occurring periods of predetermined duration, said apparatus including an addressable main memory, a read/write control circuit coupled to the main memory for alternately producing read and write control signals, a main memory input for sequentially applying digital information to the main memory, a write addressing circuit coupled to the main memory for sequentially specifying addresses into which the digital information sequentially applied to the input is to be stored during the occurrence of respective ones of the write control signals, a main memory output for sequentially receiving digital information from the main memory, and a read addressing circuit coupled to the main memory for sequentially specifying addresses from which the stored digital information is to be sequentially read during the occurrence of respective ones of the read control signals,

the improvement comprising an invalidation arrangement including:

(a) an invalidation rate generator means for producing signals simultaneously with said cyclically-occurring periods of predetermined duration;

(b) first and second invalidation memories, each having storage addresses corresponding to those in the main memory, and each coupled to the read and write addressing circuits;

(c) a write circuit coupled to respective inputs of the first and second invalidation memories and to the read/write control circuit, for alternately selecting the first and second invalidation memories during successive ones of the signals produced by the invalidation rate generator, and for effecting writing of a predefined updating value into addresses of the selected invalidation memory simultaneously with the writing of digital information into corresponding addresses of the main memory;

(d) an erase circuit coupled to the read addressing circuit, to the invalidation rate generator and to the write circuit for writing a predefined erase value into all of the addresses of the non-selected invalidation memory during each of said cyclically-occurring periods;

(e) an invalidation circuit coupled to the main memory output; and

(f) an erase value coincidence circuit coupled to respective outputs of the first and second invalidation memories and to the invalidation circuit for effecting invalidation of information read from main memory addresses corresponding to respective addresses in the first and second invalidation memories from which said coincidence circuit simultaneously receives said erase value.

4,601,002

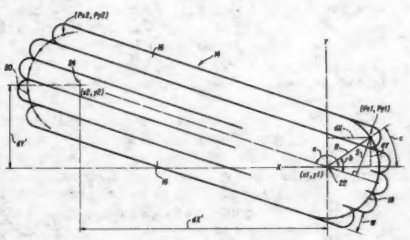
DIGITAL TECHNIQUE FOR CONSTRUCTING VARIABLE WIDTH LINES

Richard L. Rosenthal, Alexandria, Va., assignor to The United States Army Corps of Engineers as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 6, 1983, Ser. No. 456,159

Int. Cl.⁴ G06F *15/40, 15/626*

U.S. Cl. 364—518 **20 Claims**



1. A method of constructing a line having rounded ends by use of a machine, comprising the steps of:

a. forming at least one centermost stroke of predetermined length; and

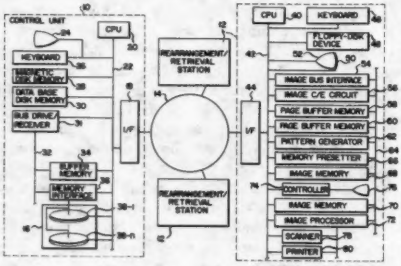
b. forming a plurality of side strokes on either side of said centermost stroke, each said side stroke being incrementally shorter in length than said centermost stroke and all other inwardly adjacent side strokes and each said side stroke being varied by calculating plot coordinates Px1, Py1 and Px2, Py2 lying upon the circumference of a semicircle at each end of the line, the semicircles being centered about the respective end points of the centermost stroke of the line.

4,601,003

DOCUMENT REARRANGEMENT SYSTEM

Tsuneo Yoneyama, Yokosuka, and Koji Izawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 22, 1983, Ser. No. 554,247
Claims priority, application Japan, Nov. 24, 1982, 57-204524
Int. Cl.[4] G06F *15/40, 3/153*
U.S. Cl. 364—518 **18 Claims**



1. A computer-processed apparatus for storing electrical document image information representing paper documents in accordance with a changeable rearranging/indexing system and for performing the filing of the document information, said apparatus comprising:

(a) a memory device for storing a totality of document information;

(b) first display means for displaying the content of document image information;

(c) second display means for visually displaying a hierarchical structure of document filing system, which represents hierarchical relationship among filing positions of document information, by using picture image patterns including pictorial illustrations of office supplied and furniture for filing paper documents, said picture image patterns representing pictorial filing items arranged in a hierarchical sequence and providing an operator a model image of an actual work plate; and

(d) control means, connected to said memory device and said first and second display means, for controlling said first display means to display the content of input document information to be newly filed and for controlling said second display means to sequentially display picture image patterns in such a manner that said second display means displays a first picture image pattern representing parent pictorial items in the hierarchical filing structure to thereby allow the operator to select a desired filing place in which the input document information is stored and changes its display screen to display a second picture image pattern, which enlarges and illustrates child/sibling pictorial items included in one of the parent items which is selected by the operator, and repeating its display operation until one of the most-specific descendant pictorial items is designated by the operator, whereby the operator is free from manually creating data for identifying the input document information from the other document information which have been filled in said apparatus so that the operator can be allowed to file the input document information in the same manner as he files actual paper documents using actual office supplies.

16. A method for storing electrical document image information representing paper documents in accordance with a changeable rearranging/indexing system and for filing the document information, said method comprising the steps of:

(a) optically scanning a paper document to be newly filed to produce corresponding electrical document image information;

(b) displaying the document information on a first display device in response to the electrical document image signal;

(c) visually displaying a hierarchical structure of document filing system, which represents hierarchical relationship among filing positions of document information, on a second display device using picture image patterns, which include pictorial illustrations of office supplies for filing paper documents and which represent pictorial filing items arranged in a hierarchical sequence to provide an operator a model image of an actual work place, in such a manner that said second display device displays a first picture image pattern representing parent pictorial items in the hierarchic filing structure to thereby allow the operator to select a desired filing place in which the input document information is to be stored and changes its display screen to display a second picture image pattern, which enlarges and illustrates child/sibling pictorial items included in one of the parent items which is selected by the operator, and repeating its display operation until one of the most specific descendant pictorial items is designated by the operator;

(d) producing, when a filing place of the input document information is finally determined by the operator upon referring to a conceptual work place image pattern displayed on said second display device, electrical code data specifying the final filing position represented by the finally selected, most specific descendant pictorial item; and

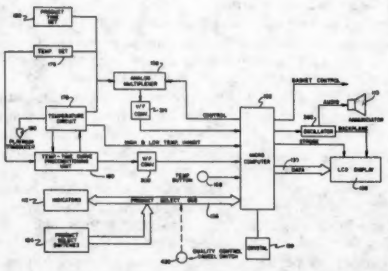
(e) automatically correlating the input document information with the electrical code data to supply the input document information to a memory device so as to store the input document information at a corresponding memory address in said memory device, whereby the operator is free from manually creating data for identifying the input document information from the other document information which have been filed in said apparatus so that the operator can be allowed to file the input document information in the same manner as he files actual paper documents using actual office supplies.

4,601,004

MICROCOMPUTER CONTROLLED COOKING TIMER AND METHOD

Ronald R. Holt, Schaumburg; William A. Joseph, and Edward J. Zeissler, both of Elburn, all of Ill., assignors to National Controls Corporation, Lombard, Ill.

Filed Dec. 3, 1981, Ser. No. 326,845
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—557 **36 Claims**



33. The method of timing and controlling the cooking cycle of a food item from the time the food item is inserted into a cooking medium, said method comprising:

establishing a preset operating temperature for the cooking medium,

establishing a preset cooking time of the food item based on said preset operating temperature,

generating a time/temperature relationship based on said preset operating temperature; said time/temperature relationship establishing time factors for the differences between the actual operating temperature and said preset operating temperature; the time factors when multiplied by said preset cooking time will generate an actual cooking time which will yield a properly cooked food item;

measuring the actual operating temperature of the cooking medium,

comparing said actual operating temperature with said preset operating temperature and determining the correct timing factor based on the difference between said preset and said actual operating temperature,

computing the actual cooking time of the food item by multiplying said preset cooking time by the correct timing factor,

measuring said actual cooking time of the food item from the time of its insertion into the cooking medium,

generating a termination signal at the end of said actual cooking time.

4,601,005

RECEIVERS FOR NAVIGATION SATELLITE SYSTEMS

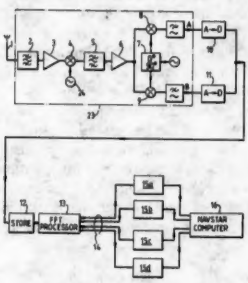
John Kilvington, Farnborough, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 14, 1982, Ser. No. 449,789

Claims priority, application United Kingdom, Dec. 31, 1981, 8139168

Int. Cl.[4] G06J *1/00*; H04J *13/00*; H04B *1/06*

U.S. Cl. 364—602 **3 Claims**



3. A receiver for a navigation satellite system, having an antenna adapted to receive coded, time-based, spreadspectrum, continuous signals which include navigational data from a plurality, P, of satellites, comprising:

means connected to said antenna for deriving baseband I and Q components from said signals;

means for digitizing said I and Q components;

a Faster Fourier Transform processor connected to receive said digitized I and Q components and to transform said components and their respective codes and to provide a first transformed signal;

multiplier means connected to said processor, for receiving said first transformed signal and multiplying together said transformed components and their codes to provide a multiplied signal;

an inverse Fast Fourier Transform processor connected to said multiplier means, for inverse transforming said multiplied signal and providing a second transformed signal; and

amplitude scanning means connected to said inverse Fast Fourier Transform processor, for determining correlation peaks in said second transformed signal.

4,601,006

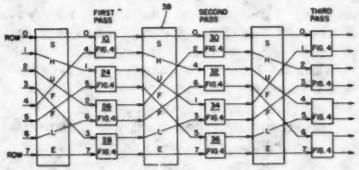
ARCHITECTURE FOR TWO DIMENSIONAL FAST FOURIER TRANSFORM

Wentai Liu, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,540

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—726 **14 Claims**



1. A pipelined and parallel system for implementing a two dimensional fast fourier transform on an array of input data values, with the transformation being performed by a plurality of serially arranged pass stages, with each pass stage comprising,

a. shuffle means for receiving an ordered set of input data for that pass stage and for performing a shuffle operation thereon to produce a shuffled order of input data, with the first pass stage receiving an ordered set of input data from a row or column of a two dimensional matrix of such input data values, and pass stages subsequent to the first pass stage receiving an ordered set of input data from the preceding pass stage; and

b. a plurality of identical switching circuit means coupled in parallel to receive the shuffled order of input data, each switching circuit means including an arithmetic logic unit with four inputs for receiving four input data values and including means for performing four data transformations of the four input data values to produce four output data values, said means for performing each of the four data transformations including a first means for performing a first operation of selective addition or subtraction of the four input data values, followed by a second means for performing a second operation of selective multiplication by an exponential multiplier.

4,601,007

FULL ADDER

Masaru Uya, Hirakata, and Katsuyuki Kaneko, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 25, 1984, Ser. No. 573,718

Claims priority, application Japan, Jan. 28, 1983, 58-13458

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—784 **5 Claims**

1. A full adder comprising:

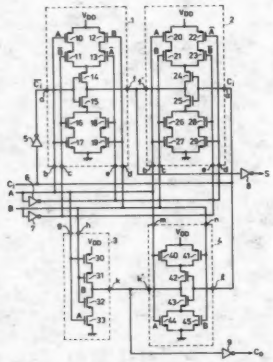
a first and a second logic gates each of which has a first, a second, a third, a fourth and a fifth input terminals, and an output terminal, and issues a lower logic level output signal at least either in a first state when all of said first, second and third input terminals are of higher logic level or in a second state when said first, fourth and fifth input terminals are of higher logic level, and issues a higher logic level output signal at least either in a third state when all of said first, second and third input terminals are of lower logic level or in a fourth state when all of said first, fourth and fifth input terminals are of lower logic level, and makes said output terminal high impedance

state when said first and second logic gates are in other states than the above-mentioned four states,

a third logic gate which has a sixth and a seventh input terminals and an output terminal, and issues a lower logic level output signal in a fifth state when both the said sixth and seventh input terminals are of higher logic level, and issues a higher logic level output signal in a sixth state when both the said sixth and seventh input terminals are of lower logic level, and makes said output terminal a high impedance state when said input terminals are in other states than the above-mentioned fifth and sixth states,

a fourth logic gate which has a eighth, a ninth and a tenth input terminals and an output terminal, and issues a lower logic level output signal at least either in a seventh state when both of said eighth and ninth input terminals are of higher logic level or in an eighth state when both of said eighth and tenth input terminals are of higher logic level, and issues a higher logic level output signal at least either in a ninth state when both of said eighth and ninth input terminals are of lower logic level or in a tenth state when both of said eighth and tenth input terminals are of lower logic level, and makes said output terminal high impedance state when said fourth logic gate is in other states than the above-mentioned seventh to tenth states,

first signal input means for inputting a first input signal to said second input terminal of said first logic gate, said



second input terminal of said second logic gate, said sixth input terminal of said third logic gate, said ninth input terminal of said fourth logic gate,

inverted first signal input means for inputting an inverted signal of said first input signal to said fifth input terminal of said first logic gate, and to said fourth input terminal of said second logic gate,

second signal input means for inputting a second input signal to said fourth input terminal of said first logic gate, said third input terminal of said second logic gate, said seventh input terminal of said third logic gate and said tenth input terminal of said fourth logic gate,

inverted second signal input means for inputting an inverted signal of said second input signal to said third input terminal of said first logic gate, and to said fifth input terminal of said second logic gate,

third signal input means for inputting a third input signal to said first input terminal of said second logic gate and said eighth input terminal of said fourth logic gate,

inverted third signal input means for inputting an inverted signal of said third input signal to said first input terminal of said first logic gate,

a first output inverter with its input terminal commonly connected to output terminals of said first and said second logic circuits and with its output terminal connected to the outside output terminal to issue summed output signal therethrough, and

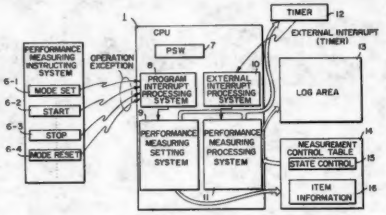
a second output inverter with its input terminal commonly connected to output terminals of said third and fourth logic circuits and with its output terminal to issue carry output signal therethrough.

4,601,008

DATA PROCESSING SYSTEM

Motokazu Kato, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1983, Ser. No. 509,610
Claims priority, application Japan, Jun. 30, 1982, 57-113317
Int. Cl.[4] G06F *11/34*
U.S. Cl. 364—900 **15 Claims**



1. A data processing system, comprising:

measurement information storing means for storing measurement information corresponding to performance measurement items;

measurement control information storing means for storing performance measurement item information and performance measurement condition information;

a timer;

storage control means for controlling information storage in said measurement control information storing means and loading an interval in said timer; and

performance measurement processing means which is started by an interrupt generated by said timer after the interval loaded by said storage control means has expired and for collecting measurement information and storing same in said measurement information storing means based on said performance measurement item information and performance measurement condition information.

4,601,009

MEMORY SYSTEM AND ACCESSING METHOD

Takashi Kogawa, Sakura; Kazuyoshi Teramoto, and Takeshi Hashimoto, both of Funabashi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Keiyo Engineering Co., Ltd., both of Tokyo, Japan

Filed Sep. 8, 1983, Ser. No. 530,470
Claims priority, application Japan, Sep. 16, 1982, 57-159491
Int. Cl.[4] G06F *12/06*
U.S. Cl. 364—900 **8 Claims**

1. A memory system comprising:

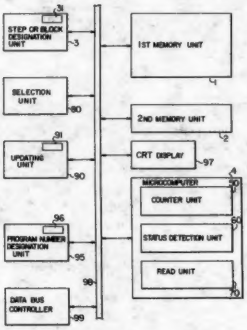
first memory means having a plurality of blocks and address fields one for each of said blocks;

second memory means having a faster access time than said first memory means and having unit chains one for each of said blocks, each of said unit chains having a step information field for storing step information representing the number of steps stored in the corresponding block, a pointer information field for storing pointer information indicating a connection to a next block, and an address storing field for storing an address corresponding to the address field of the corresponding block of said first memory means;

step designation means for producting a signal representing a step whose memory location is to be detected;

counter means for counting the number of steps stored in said step information field; and

status detection means connected to received output signals of said step designation means and said counter means for detecting a specific status therebetween, the counting by said counter means being carried out initially with respect to the unit chain corresponding to a predetermined start block and if said specific status is not detected after counting the number of steps in said start block, then the counting being carried out with respect to the unit chain corresponding to the next blocks successively indicated by the pointed information until said status detection means detects said specific status, the detection of said specific status by said status detection means indicating that said step to be detected is stored in that block of said first memory means corresponding to the unit chain with respect to which the counting by said counter means is carried out upon detection of said specific status by said status detection means.



4,601,010

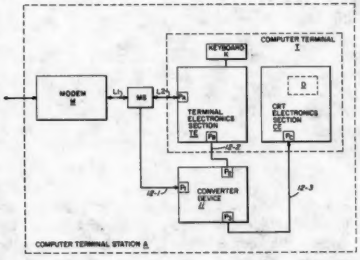
CONVERTER DEVICE FOR A COMPUTER TERMINAL

Robert J. Briscoe, 10 Cider Mill La., Upton, Mass. 01568

Filed Dec. 19, 1983, Ser. No. 562,712

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—900 **11 Claims**



1. A device for enabling a text type computer terminal to display graphics in addition to text, said computer terminal including a terminal electronics section having a data input port for receiving serial data signals from an external source and a video output port and a CRT electronics section having a video input port, said device comprising:

a. data input means for receiving serial data signals from an external source,

b. video input means for receiving video signals from the video output port of the terminal electronics section,

c. video output means for applying video signals to the video input port of the CRT electronics section,

d. a data processing system coupled to the data input means for processing data signals corresponding at least to graphics and generating therefrom video signals representative of the dot pattern represented by said data signals, and

e. means for applying either video signals from the video input means or video signals from the data processing system to the video output means.

4,601,011

USER AUTHORIZATION VERIFICATION APPARATUS FOR COMPUTER SYSTEMS INCLUDING A CENTRAL DEVICE AND A PLURALITY OF POCKET SIZED REMOTE UNITS

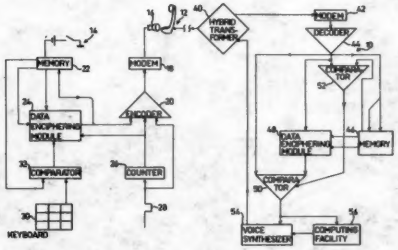
Avigdor Grynberg, 23 Hagderoth Street, Savyon, Israel

Continuation of Ser. No. 454,180, Dec. 28, 1982, abandoned. This application Mar. 18, 1985, Ser. No. 712,903

Claims priority, application Israel, Dec. 31, 1981, 64675

Int. Cl.[4] G06F *13/14, 15/21*

U.S. Cl. 364—900 **17 Claims**



1. A remote authorization verification system comprising:

a central device including:

data input and output facilities for communicating user authorization verification data with a plurality of hand held, pocket size remote units and providing an output indication of user authorization status,

a memory for storing predetermined user authorization verification data for comparison purposes including coding keys, each of which is synchronized with the coding key of each of said remote units and

data comparison facilities for comparing user authorization verification data received from said plurality of hand held, pocket size remote units with user authorization verification data stored in said memory for determining whether authorization exists; and

a plurality of hand held, pocket size remote units providing data communication with said central device via conventional telecommunications devices, said pocket size remote units each including:

information input keying means, for receiving a user memorized password code,

verification means for confirming receipt of a correct user memorized password code assigned to each individual remote unit and means for providing an enabling output in response to receipt of said correct password code by said verification means, a memory for storing a coding key, and

enciphering means operative when enabled by said enabling output, and in accordance with said coding key for providing an enciphered verification code for transmission to said central device for indicating the authorized status of a user,

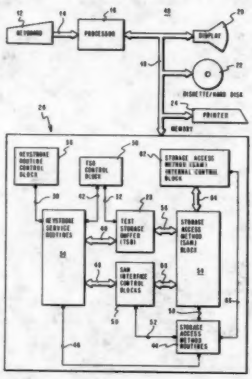
each of said remote units being operative to produce an

enciphered verification code by employing the coding key stored in its memory in response to the password code inputted through its information input keying means, said verification code being different for each entry of said correct password code.

4,601,012
ZONE PARTITIONING IN VOLUME RECOVERY SYSTEM

John A. Aiken, Jr., Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1984, Ser. No. 586,597
Claims priority, application Japan, Mar. 11, 1983, 58-39317
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—900 **11 Claims**



1. In a word processing system where a text stream is stored on a direct access storage device and where said text may be selected later for revision, a method for detecting errors in data sets and volume indexes on a storage volume which require recovery before normal access may proceed, said method comprising the steps of:

partitioning said storage volume into a plurality of zones;

opening a data set on one of said plurality of zones for read/-write access;

closing said data set on said one of said plurality of zones for read/write access; and

recovering each of said plurality of zones by treating each of said plurality of said zones as an independent storage volume.

4,601,013
MAGNETIC BUBBLE MEMORY DEVICE

Ryo Suzuki, Kodaira; Yutaka Sugita, Tokorozawa; Naoki Kodama; Masatoshi Takeshita, both of Hachioji, and Teruaki Takeuchi, Kokunbunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

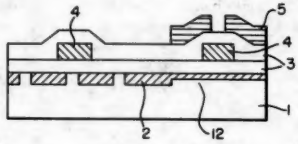
Continuation of Ser. No. 451,094, Dec. 20, 1982, abandoned. This application Feb. 27, 1985, Ser. No. 706,182
Claims priority, application Japan, Dec. 18, 1981, 56-203723
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—36 **9 Claims**

1. A magnetic bubble memory device comprising:

a bubble supporting layer in which a bubble of cylindrical magnetic domain is held and propagated;

a first ion-implanted region formed in a surface area of said bubble supporting layer, said region having an ion-implantation pattern forming a first bubble propagation path which propagates a magnetic bubble in accordance with a driving magnetic field revolving in the plane of said bubble supporting layer;

a plurality of magnetically soft elements formed over said bubble supporting layer, said elements being connected to said first bubble propagation path so as to form a second bubble propagation path which propagates a magnetic bubble in accordance with said driving magnetic field; and

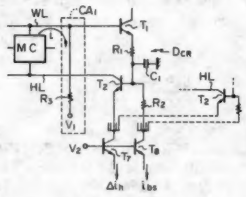


a second ion-implanted region for hard buble suppresion formed in a surface of said bubble supporting layer so as to confront at least a majority of the area where said second bubble propagation path is formed, said second ion-implanted region being thinner than siad first ion-implanted region, said second ion-implanted region having a thickness of at most 1000 Angstroms.

4,601,014
SEMICONDUCTOR MEMORY WITH WORD LINE CHARGE ABSORBING CIRCUIT

Kouichi Kitano, Tokyo, and Hideaki Isogai, Higashikurume, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 17, 1983, Ser. No. 476,263
Claims priority, application Japan, Mar. 19, 1982, 57-43978; Sep. 27, 1982, 57-166711
Int. Cl.[4] G11C *11/40, 7/00*
U.S. Cl. 365—155 **8 Claims**



1. A semiconductor memory circuit, comprising:

a plurality of word lines;

a plurility of hold lines;

a plurality of pairs of bit lines;

a plurality of saturation-type memory cells, each comprising cross-coupled PNPN circuits operatively connected to one of said pairs of bit lines and driven by a corresponding word line and a corresponding hold line;

hold current sources for always passing a hold current through each hold line;

a delay circuit operatively connected to one of said word lines and one of said hold lines;

a common additional hold current source operatively connected to the delay circuit for passing an additional hold current through said corresponding hold line, during a transition from a selection state to a nonselection state and not passing the additional hold current through the corresponding hold line during a transition from the nonselection state to the selection state of said corresponding word line, in cooperation with said delay circuit; and

a charge absorbing circuit for and operatively connected to each said corresponding word line, said charge absorbing circuit absorbing a current, induced by a voltage increase in said corresponding word line due to a surplus charge from one of said saturation-type memory cells, occurring

soon after said corresponding word line is switched from the selection state to the nonselection state.

4,601,015

JOSEPHSON MEMORY CIRCUIT

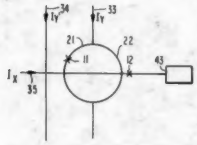
Ichiro Ishida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,631

Claims priority, application Japan, Feb. 23, 1982, 57-27611; Feb. 23, 1982, 57-27612

Int. Cl.⁴ G11C *11/44*

U.S. Cl. 365—162 **8 Claims**



1. A Josephson memory circuit comprising: a closed superconducting loop having a first node and including therein a first Josephson gate; a first line connected to said first node; a second Josephson gate disposed in electromagnetically coupled relationship with said superconducting loop; a second line disposed in electromagnetically coupled relationship with said first Josephson gate; and a third line connected to said second Josephson gate and a detector for detecting a state of said second Josephson gate through said second Josephson gate and disposed in electromagnetically coupled relationship with said first Josephson gate, each of said Josephson gates having an input and an output and having a non-voltage state in which it presents a very low impedance between its input and output and a voltage state in which it presents a very high impedance between its input and output, said first Josephson gate being switched to the voltage state when current pulses of predetermined levels I_Y, $I_{Y'}$ and I_{X1} are coincidentally supplied to said first, second and third lines, respectively, and said first Josephson gate being thereafter switched to the non-voltage state when said current pulses are no longer coincidentally supplied to said first, second and third lines to thereby set up a persistent current flowing in said superconducting loop, and said second Josephson gate being switched to the voltage state by the coincident supply of currents I_X and I_Y of predetermined levels when a persistent current flowing in said superconducting loop is set up.

4,601,016

SEMICONDUCTOR MEMORY CELL

Peter C. Roberts, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1983, Ser. No. 507,617

Int. Cl.⁴ G11C *11/36*

U.S. Cl. 365—175 **22 Claims**

18. An electrical device, comprising:

first switching means having a first input and a first output;

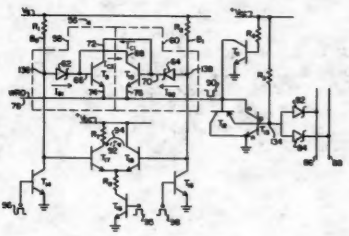
second switching means having a second input and a second output, wherein said first output is directly electrically connected to said second input and said second output is directly electrically connected to said first input;

third switching means having a third input and a third output;

fourth switching means having a fourth input and a fourth output, wherein said third output is directly electrically connected to said fourth input and said fourth output is directly electrically connected to said third input;

first, second, third and fourth unidirectional current conducting means wherein said first unidirectional current conducting means is directly electrically connected to said first input, said second unidirectional current conducting means is directly electrically connected to said second input, said third unidirectional current conducting means is directly electrically connected to said third input and said fourth unidirectional current conducting means is directly electrically connected to said fourth input;

first access line having a first terminal wherein said first terminal is directly electrically connected to said first unidirectional current conducting means and said third unidirectional current conducting means, and wherein



said first terminal is electrically connected to a first current source;

second access line having a second terminal wherein said second terminal is directly electrically connected to said second unidirectional current conducting means and said fourth undirectional current conducting means, and wherein said second terminal is electrically connected to a second current source; and

wherein no electrical current sources are directly electrically connected to said switching means.

4,601,017

SEMICONDUCTOR MEMORY DEVICE HAVING ACTIVE PULL-UP CIRCUITS

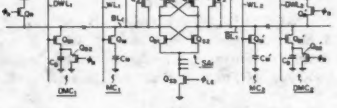
Hirohiko Mochizuki, Kawasaki; Yoshihiro Takemae, Tokyo; Tomio Nakano, Kawasaki, and Kimiaki Sato, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 15, 1983, Ser. No. 561,964

Claims priority, application Japan, Dec. 22, 1982, 57-223678

Int. Cl.⁴ G11C *11/40, 7/00*

U.S. Cl. 365—189 **8 Claims**



1. A semiconductor memory device, comprising:

a power supply terminal;

a plurality of pairs of bit lines;

a plurality of sense amplifiers, each operatively connected to one pair of said pairs of bit lines, for sensing a difference in potential therebetween;

a plurality of active pull-up circuits, each operatively, connected to an associated one of said bit lines in one of said pairs of bit lines, for pulling up a first potential level of the associated one of said bit lines, comprising:

a first transistor having a drain operatively connected to said power supply terminal, a source operatively connected to the associated one of said bit lines and a gate;

a second transistor having a drain operatively connected to

the gate of said first transistor, a source operatively connected to the associated one of said bit lines and a gate operatively connected to the other bit line of the pair;

a capacitor having a first terminal operatively connected to the gate of said first transistor and a second terminal;

pull-up signal means, operatively connected to the second terminal of said capacitor, for generating an active pull-up signal; and

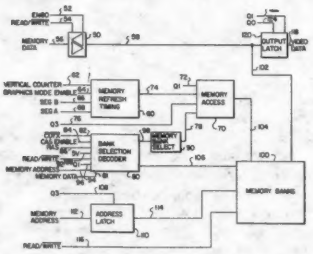
transmitting means, operatively connected to the gate of said first transistor and to the associated one of said bit lines, for transmitting the first potential level of the associated one of said bit lines to the gate of said first transistor.

4,601,018

BANKED MEMORY CIRCUIT

Allen Baum, 2310 Cornell St., Palo Alto, Calif. 94306, and Peter Baum, 21907 Almaden Ave., Cupertino, Calif. 95014

Filed Jan. 29, 1985, Ser. No. 696,038
Int. Cl.[4] G11C *11/30*
U.S. Cl. 365—189 **20 Claims**



1. A memory circuit for interconnection to a data processor having a central processing unit, said memory circuit being adapted to add additional memory storage to said data processor comprising in combination:

a plurality of memory banks, each bank including memory means for storage of information;

a bank selection circuit means connected to said central processing unit for receiving information from the data processor indicating a selected one of the memory banks, and responsive to a timing signal generated by said central processing unit responsive to the operating sequence of said central processing unit; and

memory access means for alternating access between the selected memory bank and a specific memory bank.

4,601,019

MEMORY WITH REDUNDANCY

Ashwin H. Shah; James D. Gallia, both of Dallas; I-Fay Wang, Richardson, and Shivaling S. Mahant-Shetti, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1983, Ser. No. 528,209
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—200 **24 Claims**

1. A memory comprising:

(a) a plurality of memory cells arranged in rows and columns, said columns of memory cells being organized by bit positions, each bit position including more than one of said columns of memory cells and at least one sense amplifier;

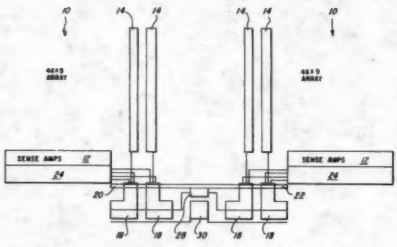
(b) at least one redundant column of memory cells, and a sense amplifier operatively connected thereto;

(c) at least two output means, said output means being connected to respective ones of said array sense amplifiers to provide simultaneous data outputs corresponding to memory cells at different ones of said bit positions;

(d) redundancy select logic means for storing defect position information, including both defective column address information and also bit position defect information indicating which of said bit positions includes said defective column; and

(e) means for comparing column address signals with said stored defective column address signals to provide a match signal;

(f) said redundancy select logic means including means responsive to a said match signal to connect said redundant column sense amplifier to said output means corresponding to the one of said bit positions which is encoded by said bit position defect information, whenever said externally received column address matches said stored defective column address;



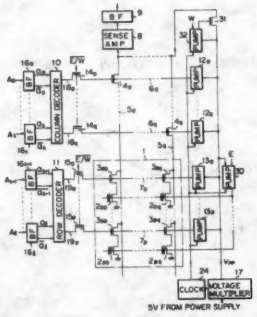
(g) each of said array cells, said redundant cells, said sense amplifiers, said output means, said means for comparing and said redundancy select logic being integrated on a single chip.

4,601,020

SEMICONDUCTOR MEMORY DEVICE

Hideki Arakawa, and Hiromi Kawashima, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1983, Ser. No. 566,321
Claims priority, application Japan, Dec. 29, 1982, 57-229267
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—226 **9 Claims**



1. A semiconductor memory device for providing a writing or erasing operation, comprising:

a plurality of column lines;

a plurality of row lines;

a column decoder, operatively connected to said column lines, for selecting one of said column lines;

a row decoder, operatively connected to said row lines, for selecting one of said row lines;

a plurality of memory cells, one of said memory cells being

accessed by a selected one of said column lines and a selected one of said row lines;

a clock generator for producing clock pulses;

a voltage supply for supplying a high voltage; and

a plurality of charge pump circuits, respectively, operatively connected to said column lines and said row lines and operatively connected to said clock generator and said voltage supply, for increasing the voltage on said selected ones of said column and row lines to the high voltage of said voltage supply during the writing or erasing operation, each of said charge pump circuits comprising:

a capacitor, operatively connected to said clock generator, charging and discharging in response to the clock pulses from said clock generator;

a charge transfer transistor, operatively connected to said capacitor, for transferring charge from said voltage supply to said column or row line connected thereto, in response to the charge on said capacitor; and

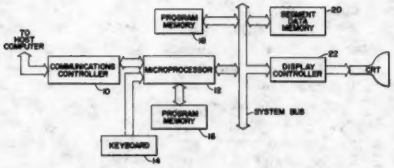
gate means, operatively connected between said clock generator and said capacitor, for cutting off said capacitor, if said column or row line connected to said respective charge pump circuit is unselected, from said clock generator.

4,601,021

HIGHLIGHTING AND CLASSIFYING SEGMENTS ON A CRT DISPLAY

Byron G. Paul, Portland; James H. Maynard, West Linn, and John C. Dalrymple, Newberg, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 367,525, Apr. 12, 1982, abandoned.
This application Dec. 19, 1984, Ser. No. 684,962
Int. Cl.[4] G06K *9/20*; G06F *15/20*
U.S. Cl. 364—521 **6 Claims**



1. An apparatus for classifying display segments on a Graphics Display Terminal, comprising:

introducing means for introducing a new segment number and new classification information associated with the new segment into said graphics display terminal;

storing means for storing a plurality of segment words therein, each of said segment words including a segment number and current classification information associated with the segment; and

processing means responsive to the new classification information introduced via said introducing means for locating a segment word in the storing means having a segment number corresponding to said new segment number and for comparing the current classification information of the located segment word with the new classification information introduced via said introducing means, said processing means changing the current classification information of the located segment word to correspond to the new classification information,

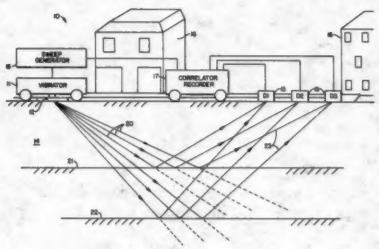
said processing means storing the located segment word having the changed classification information in said storing means in response thereto.

4,601,022

SEISMIC EXPLORATION USING NON-IMPULSIVE VIBRATORY SOURCES ACTIVATED BY STATIONARY, GAUSSIAN CODES, AND PROCESSING THE RESULTS IN DISTORTION-FREE FINAL RECORDS PARTICULARLY USEFUL IN URBAN AREAS

Francis Muir, Laguna Niguel, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 23, 1983, Ser. No. 525,760
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—14 **8 Claims**



1. A method of seismic surveying using non-impulsive vibratory sources that recovers all the essential information of full-waveform recording in a distortion-free manner in an urban area having statutes controlling drive level of such sources to a maximum level $F_m(t)$ which, comprises:

A. injecting non-impulsive, seismic vibrations into the earth by activating at least one vibratory source with a driving code of Gaussian, zero-mean, stationary characteristics wherein the drive level $F_m(t)$ is not exceeded;

B. recording the seismic vibrations that have propagated through the earth from said at least one vibratory source to at least one receiver; and

C. cross-correlating a full-waveform-preserved representation of said injected vibrations with said received seismic vibrations; the result of said cross-correlation being a seismic survey record that is essentially distortion-free.

4,601,023

AUTOMATIC GAIN CONTROL IN SEISMIC DATA SAMPLES

Bonita F. Bowman, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,829
Int. Cl.[4] G01V *1/36*
U.S. Cl. 367—65 **3 Claims**

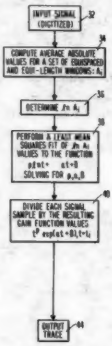
1. In a method of seismic exploration in which the amplitude of signals output by a geophone in a response to detection of a seismic wave within the earth is sampled at intervals to obtain a series of samples, the improvement which comprises applying automatic gain control compensation to said sample amplitude values, said compensation being applied according to the following steps:

selecting a plurality of respective windows of said series;

determining the average absolute value of the amplitude of the samples within each of said windows;

determining the logarithms of said average absolute values, least means squares fitting the logarithms of said average absolute values to a logarithmic function, according to

which values for parameters defining said logarithmic function are determined; and


INPUT SIGNAL (DIGITIZED)
32
COMPUTE AVERAGE ABSOLUTE VALUES FOR A SET OF EQUISPACED AND EQUI-LENGTH WINDOWS: A_i
34
DETERMINE $f(x, A_i)$
36
PERFORM A LEAST MEAN SQUARES FIT OF $f(x, A_i)$ VALUES TO THE FUNCTION $g(x)=x^{\alpha}e^{-\beta x}$ SOLVING FOR α, β
38
DIVIDE EACH SIGNAL SAMPLE BY THE RESULTING GAIN FUNCTION VALUES $t^{\alpha}\exp(-\beta(t-t_0))$
40
OUTPUT TRACE
44

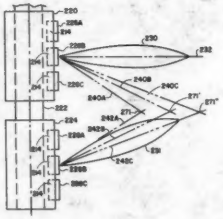
applying a gain function to each of said sample values, said gain function corresponding to said logarithmic function.

4,601,024

BOREHOLE TELEVIEWER SYSTEM USING MULTIPLE TRANSDUCER SUBSYSTEMS

Robert A. Broding, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 10, 1981, Ser. No. 242,497
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—86 **6 Claims**



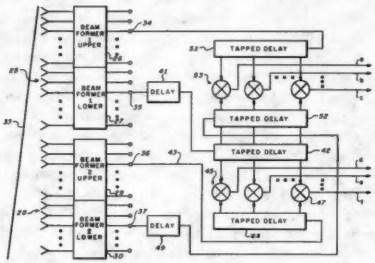
1. A Method of logging a borehole in the earth comprising:
(a) generating a first acoustic signal having the frequency F1 at a depth in the borehole;
(b) generating a second acoustic signal having the frequency F2 which is less than F1 in the borehole at approximately the depth;
(c) generating a first electrical scan signal representative of a response to the first acoustic signal;
(d) generating a second electrical scan signal representative of a response to the second acoustic signal;
(e) discarding all of the first electrical scan signal except a first portion,
(f) discarding a first portion of the second electrical scan signal and retaining a second portion,
(g) adding the first portion of the electrical scan signal and the second portion of the second electrical scan signal and obtaining a composite signal.

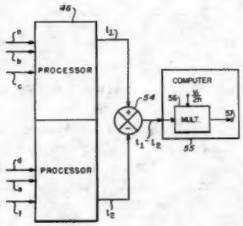
4,601,025

ANGLE TRACKING SYSTEM

John D. Lea, Huntington, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,758
Int. Cl.[4] G01S *3/82*
U.S. Cl. 367—125 **9 Claims**





1. A passive apparatus for measuring an angle to a signal emitter comprising:
first and second means positioned with a predetermined separation distance along a first axis therebetween for receiving signals emitted from said emitter signal;
third and fourth means positioned with said predetermined separation distance along said first axis for receiving said emitted signals, located a preselected distance from said first and second means along a second axis and relatively positioned along said first axis such that said first and third means and said second and fourth means are correspondingly positioned along said first axis;
time difference means coupled to said four receiving means for providing a signal representative of a first differential time t_1 between a signal arrival at said first receiving means and said signal arrival at said fourth receiving means and a signal representative of a second differential time t_2 between said signal arrival at said second receiving means and said third receiving means: and
means for providing a signal representative of a difference between times t_1 and t_2, said difference between t_1 and t_2 being representative of said angle to said signal emitter.

4,601,026

AUTOCHANGER TYPE DISC PLAYER

Hiroshi Kawakami, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jun. 8, 1984, Ser. No. 618,937
Claims priority, application Japan, Jun. 13, 1983, 58-105281
Int. Cl.[4] G11B *17/04, 17/22*
U.S. Cl. 369—38 **11 Claims**

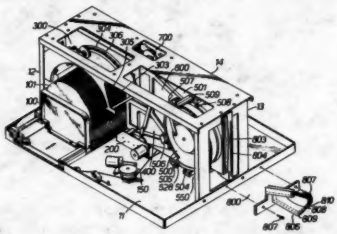
1. An autochanger type disc player for selectively playing stored dics or externally-inserted discs, said disc player comprising:

a housing having disc insertion means at one end of said housing for inserting or withdrawing externally-inserted discs from said housing;

a disc storage section in said housing having means for retaining a plurality of stored discs, said disc storage section positioned at an opposite end of said housing from said disc insertion means;

a disc playback section including means for playing either stored or externally-inserted discs and means for holding said playback section in a first position and a second position, and an opening through which said disc may be loaded into or unloaded from said disc playback section, said disc playback section positioned substantially between said disc insertion means and said disc storage section;

a first disc transferring means between said disc storage section and said disc playback section, said first disc transferring means having one end opposite said opening when said disc playback section is held in said first position;



a second disc transferring means connected with said disc insertion means and said disc playback section to allow transfer of discs between said disc insertion means and said disc playback section, said second disc transferring means having one end opposite said opening when said disc playback section is in said second position; and

means for controlling said disc playback section to hold said disc playback section in said first position to transfer discs to and from said first disc transferring means and to hold said disc playback section in said second position to transfer discs to and from said second disc transferring means and thereby to allow said disc playback section to play stored discs from said disc storage section or externally-inserted discs supplied through said disc insertion means.

4,601,027

OPTICAL FDM SYSTEM

Robert W. A. Scarr, Stansted, and John Bingham, Dunmow, both of United Kingdom, assignors to International Standard Electric Corporation, New York, N.Y.

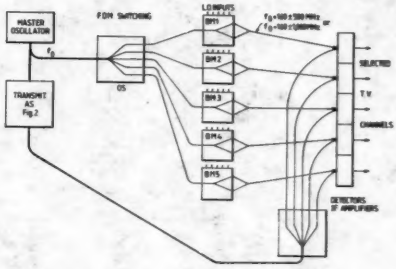
Filed Jun. 21, 1984, Ser. No. 622,940

Claims priority, application United Kingdom, Jul. 1, 1983, 8317962

Int. Cl.[4] H04B *9/00*

U.S. Cl. 370—3 **1 Claim**

1. A frequency division multiplex (FDM) system in which the transmission medium is an optical fibre cable, which system comprises a number of channels whose frequencies are widely and uniformly spaced across the available frequency spectrum, and comprises a single oscillator associated with all of the channels which provides a single output frequency at or near to a central point of the frequency spectrum, and comprising a modulation arrangement to which the single output frequency is applied and which generates therefrom a number of outputs each providing a carrier frequency for one of the channels, wherein the outputs are derived from the oscillator's output by the subtraction therefrom of a second frequency one or more times to give one or more further frequencies and by the addition of the second frequency to the oscillator's output to give one or more further frequencies, and wherein the further frequencies, or the further frequencies plus said single oscillator frequency are used as the carriers for the FDM channels in which the modulation arrangement is a Raman-Nath device to which an oscillator frequency f_0 and the further frequency f are both applied, and in which the Raman Nath device provides $2N+1$ outputs at frequencies, N of which are below f_0 and N of which are above f, and in which $N=2$, so that the Raman Nath device provides outputs at frequencies (f_0-2f), (f_0-f), f, (f_0+f) and (f_0+2f) and further comprising $2N+1$ channel modulators, to each of which a respective output of the Raman Nath device is applied, one per channel served, and in which the outputs of the channel modulators are combined in a combiner for application to an optical fibre connected to a remote station and further comprising a further optical fibre to which the output of the oscillator is connected and which is also connected to the remote station whereby it can detect the signals on the various channels and further comprising an optical splitter at each remote station which functions to give $2N+1$ similar outputs, a set of $2N+1$ Bragg modulators, one per channel, to which said similar outputs are respectively applied, and comprising a further optical splitter which receives an output from the combiner, and functions to give $2N+1$ outputs, and in which the outputs from the Bragg modulators and from the further optical splitter are respectively combined to effect detection.



4,601,028

METHOD OF AND APPARATUS FOR CHECKING DATAPATH FAILURE IN A COMMUNICATION MULDEM

Charles E. Huffman, Plano, and Paul E. Pepmiller, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 18, 1984, Ser. No. 621,397

Int. Cl.[4] H04J *1/16, 3/14, 3/22*

U.S. Cl. 370—15 **9 Claims**

1. Testing apparatus of the class described comprising, in combination:

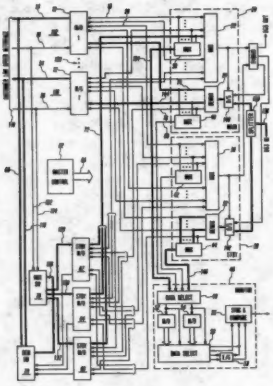
high speed to low speed muldem apparatus comprising a plurality of multiplex-demultiplex modules where each of the modules interfaces between a common frequency and, depending on the application, one of either a customer low speed frequency or a high speed line frequency;

bit by bit comparator apparatus connected to each of said modules for testing the module by comparing data input to the module at the common frequency with data output by the module and returned through other datapaths where it is returned to the common frequency and checked for identity of logic value with the data input;

means for directing typical transmission line data to a module to be tested for operability and to said comparator apparatus; and

means for providing a return datapath connection, including

reconversion means to said common frequency, for the non-common frequency terminals of said module to be tested to said comparator means for the bit by bit comparison testing.



4,601,029

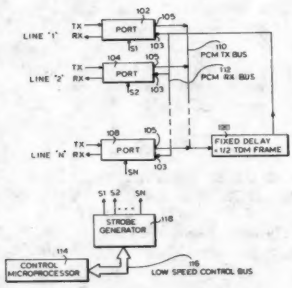
COMMUNICATION SWITCHING SYSTEM

Franklin Hargrave, and Francisco A. Middleton, both of Newtown, Conn., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,754

Int. Cl.[4] H04Q *11/04*; H04J *3/02*

U.S. Cl. 370—67 **14 Claims**



1. A communication switching system for selectively interconnecting a plurality of lines, comprising:

a transmit bus for propagating a plurality of incoming signals in a repetitive sequence of time slots each sequence defining a frame;

a receive bus for transmitting said plurality of signals in said repetitive sequence of time slots;

a communication port for each of said lines for accessing simultaneously said transmit and receive bus during a selected slot;

control means for assigning a selected slot to each of said communication ports, and for activating the respective communication ports during the selected slots, said control means assigning time slots that differ by one-half frame to said communication ports associated with two interconnected lines; and

transfer means for delaying said incoming signals on said transmit bus by a half-frame period and for producing outgoing signals on said receive bus by transferring the delayed incoming signals from the transmit bus to the receive bus.

4,601,030

MULTIPOINT SYSTEM FOR INTERCONNECTING WORK STATIONS

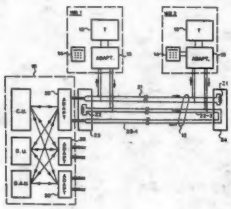
Alain Croisier, Cagnes sur Mer, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,634

Claims priority, application European Pat. Off., Dec. 28, 1982, 82430048.7

Int. Cl.[4] H04J *3/00*

U.S. Cl. 370—88 **3 Claims**



1. A communication system comprising:

a control station having a transmit output and a receive input;

a plurality of work stations distributed over a geographic area, each of which work stations is provided with a receive input and a transmit output;

first unidirectional electric signal transmission media connecting the control station output in parallel to the input of each of the work stations for conveying signals from the control station to the work stations;

second unidirectional electric signal transmission media connecting the control station input in parallel to the output of each of the work stations for conveying signals from the work stations to the control station;

said work stations being connected to said first and second transmission media such that the electric signal propagation delay along the first and second media between stations is substantially the same whereby receipt of a message sent to a work station on said first transmission media controls the sending by that work station of a message on the said second transmission media without interference with messages sent by other work stations on the said second transmission media.

4,601,031

REPAIRABLE ROM ARRAY

Christopher P. H. Walker, Bristol, England, and Peter J. Wilson, Colorado Springs, Colo., assignors to Inmos Limited, Bristol, England

Filed Oct. 24, 1983, Ser. No. 545,082

Claims priority, application United Kingdom, Oct. 29, 1982, 8231055

Int. Cl.[4] G06F *11/22*

U.S. Cl. 371—10 **25 Claims**

1. A read only memory (ROM) comprising:

a ROM array arranged in rows and columns;

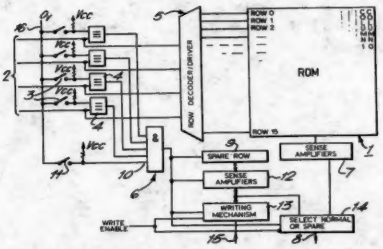
a set of memory locations for storing a respective check bit for each column;

a set of check bits stored in said set of memory locations, said check bits being derived from the data intended to be stored in said ROM;

a means for accessing selected rows in said ROM array in response to row addresses; and

apparatus for repairing the ROM array by replacing a row which has been found to have one or more defects, said

repairing apparatus comprising means for storing the address of the defective row, a spare row of programmable memory for storing the data bits intended to have been stored in the defective row, means causing said spare row



to be accessed whenever said defective row is addressed whereby said defective row is replaced by said spare row, and means for generating data to be stored in the spare row from the data and check bits stored in the ROM array, except in the defective row.

4,601,032

TEST-GENERATION SYSTEM FOR DIGITAL CIRCUITS

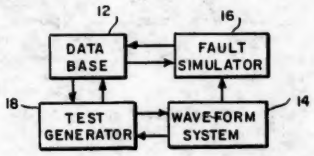
Gordon D. Robinson, Fareham, United Kingdom, assignor to Cirrus Computers Ltd., Fareham, United Kingdom

Filed Dec. 29, 1983, Ser. No. 566,876

Claims priority, application United Kingdom, Oct. 17, 1983, 8327753

Int. Cl.⁴ G06F *11/04*

U.S. Cl. 371—23 **2 Claims**



1. A method of testing a non-scan-type digital circuit, the digital circuit having output ports, being adapted to receive input vectors, and being arranged to produce outputs at its output ports in response to application of the input vectors, the method comprising the steps of:

A. simulating (i) a fault-free version of the digital circuit having stored state so that its output at a given time depends not only on its input at that time but also on its input of previous times and being of the non-scan type so that its state is not directly observable and (ii) faulty versions of the digital circuit having predetermined faults;

B. deriving an input-sensor sequence, at least some of whose input vectors remain to be determined prior to derivation, to produce an input waveform whose application to any of the simulated faulty versions will result in outputs that differ from the outputs that result when that waveform is applied to the fault-free version, by choosing each input vector in at least a group of successive input vectors so as to cause propagation of a fault or fault effect chosen from among all the faults that have not been propagated to an output port by previous vectors in the waveform and from among all the fault effects that have resulted from those faults after application of all the previous input vectors in the waveform, the choice of fault or fault effect being made without regard to which faults or fault effects were propagated by previous input vectors in the waveform, the derivation of each unpredetermined input vector in the group being performed by using knowledge of the states of the simulated faulty versions that result from application of all the input vectors preceding that input vector in the waveform but without using knowledge of the actual values of previous or subsequent input vectors in the waveform;

C. applying the input vectors of the derived waveform to the digitial circuit; and

D. observing the resulting outputs of the digital circuit to determine whether the digital circuit has any of the predetermined faults.

4,601,033

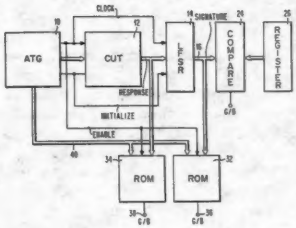
CIRCUIT TESTING APPARATUS EMPLOYING SIGNATURE ANALYSIS

Michael Whelan, Titusville, N.J., assignor to Siemens Corporate Research & Suppport, Inc., Iselin, N.J.

Filed Jan. 16, 1984, Ser. No. 571,256

Int. Cl.⁴ G06F *11/00*

U.S. Cl. 371—25 **3 Claims**



1. Apparatus for testing an electrical circuit having a first input and a first output, said apparatus comprising, in combination:

(a) test control means for applying a test sequence of test signals to said first input of said electrical circuit thereby to evoke, in response to each test signal, a response signal by said electrical circuit at said first output;

(b) linear feedback signature register (LFSR) means, having a second output plus a second input, the second input is connected to said first output of said electrical circuit, the LFSR means producing a state signal at said second output representing the current state of said LFSR means, in dependence upon the prior state of said LFSR means and a received response signal;

(c) programmed, first read-only-memory (ROM) means having a first data output plus a first address input, the first address input is connected to said second output of said LFSR means, the first ROM means producing a first signal at said first data output upon receipt of said state signal if said state signal represents a permissible state of said LFSR means during a test of said electrical circuit, and the first ROM means producing a second signal at said first data output upon receipt of said state signal if said state signal does not represent a permissible state of said LFSR means.

4,601,034

METHOD AND APPARATUS FOR TESTING VERY LARGE SCALE INTEGRATED MEMORY CIRCUITS

Thirumalai Sridhar, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 30, 1984, Ser. No. 595,065

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—25 **12 Claims**

1. A system for testing a high density memory on a chip, comprising;

a high density memory with plural memory cells formed on a single semiconductor chip;

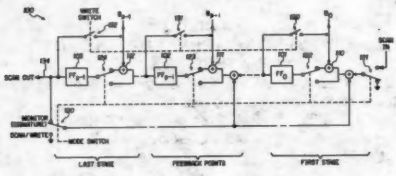
a plurality of bit lines connected to the memory cells of said high density memory;

at least one parallel signature analyzer disposed on said chip adjacent the high density memory;

said parallel signature analyzer including:

means coupled to said bit lines for selectively applying signals onto said bit lines to be written into the memory cells of said high density memory;

means for selectively reading memory states of the memory cells of said high density memory;



and means responsive to said read memory states for developing a signature from the memory states read for indicating whether the selectively applied signals were properly written into and read from the memory cells of said high density memory wherein said parallel signature analyzer comprises a multiple input linear feedback shift register wherein said shift register comprises a plurality of flip-flops, each having an input connected to a bit line of a respective one of said memory elements through an exclusive-OR gate and to an output of a preceding flip-flop through said exclusive-OR gate.

4,601,035

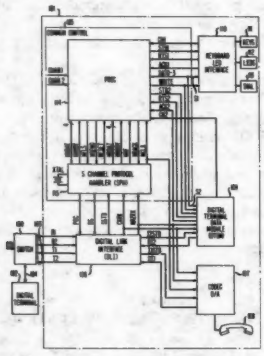
DATA COMMUNICATION METHOD AND CIRCUITRY

Richard P. Marzec, Lincroft; George W. Schramm, Oakhurst, both of N.J.; John B. Sharp, Denver, Colo.; David J. Stelte, Wheaton, Ill., and David M. Tutelman, Wayside, N.J., assignors to AT&T Bell Laboratories and AT&T Information Systems, both of Murray Hill, N.J.

Filed Oct. 3, 1983, Ser. No. 538,158

Int. Cl.[4] G06F *11/00*; G08C *25/00*

U.S. Cl. 371—32 **12 Claims**



1. A terminal for receiving numbered data transmissions (I) over a facility, said terminal comprising:

means responsive to a received correctly numbered data transmission for transmitting a numbered acknowledge signal (RR) over said facility identifying said correctly numbered data transmission, and

means for transmitting only said numbered acknowledge signal in response to a subsequently received incorrectly numbered data transmission.

4,601,036

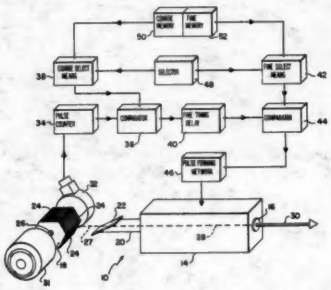
RAPIDLY TUNABLE LASER

Frederick R. Faxvog, Plymouth, and Hans W. Mocker, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,930

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—20 **16 Claims**



1. A rapidly tunable laser, comprising:

first and second means for at least partially reflecting light, wherein said second reflecting means is continuously rotated about a first axis and said first and second reflecting means define an optical cavitiy;

a medium in said optical cavity which is capable of lasing at a plurality of light wavelengths along a second axis between said first and second reflecting means;

dispersive means for directing various of said wavelengths of light individually along said second axis as said second reflecting means is rotated;

means for exciting said medium to said lasing condition;

means for storing data of possible angular positions, of said second reflecting means relative to said first axis;

means for retrieving selected of said data, wherein said data can be retrieved in any order;

means for determining an angular position of said second reflecting means;

means for comparing said retrieved data to said actual angular position of said second reflecting means; and

means for activating said excitation means when said actual angular position of said second reflecting means is included within said retrieved data.

4,601,037

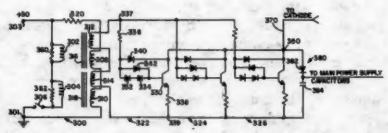
PULSED LASER SYSTEM

John J. McDonald, San Marino, Calif., assignor to Britt Corporation, Los Angeles, Calif.

Filed Jun. 13, 1984, Ser. No. 620,345

Int. Cl.[4] H01S *3/10*

U.S. Cl. 372—25 **3 Claims**



1. A pulsed laser system comprising:

a laser tube having electrodes;

a power switching means coupled to the electrodes of said laser tube for energizing said laser tube in response to a series of periodic control signals to generate a burst of laser output signals;

power control means movable between an off position and on position for activating said laser tube by enabling said generating means to apply said control signals to said power switching means in said on position; and repeat means coupled to said generating means for automatically repeating at a predetermined interval said burst of laser pulses generated within a preselected exposure time while said power control means is held in said on position.

4,601,038

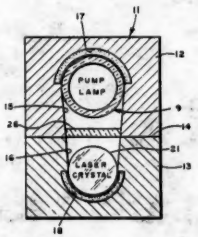
CONDUCTION COOLED SOLID STATE LASER

Steve Guch, Jr., Saratoga, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Continuation of Ser. No. 555,750, Nov. 28, 1983, abandoned, which is a continuation of Ser. No. 319,838, Nov. 9, 1981, Pat. No. 4,429,348. This application Jan. 28, 1985, Ser. No. 695,764

Int. Cl.[4] H01S *3/04*

U.S. Cl. 372—34 19 Claims



1. A conductively cooled laser assembly comprising:

an elongated housing constituting a heat sink having a cavity and comprising first and second sections;

a laser crystal in said cavity within said first section;

a pump lamp in said cavity within said second section;

a totally reflective element and a partially transmissive element adjacent to opposite ends, respectively, of said crystal and defining therebetween the laser cavity;

a first thin highly reflective and highly thermally conductive layer engaging the exterior of said crystal adjacent to said housing;

a second thin highly reflective and highly thermally conductive layer engaging the exterior of said lamp adjacent to said housing;

a first space between said first conductive layer and said housing;

a second space between said second conductive layer and said housing;

a first separate fluidic material having a predetermined thermal conductivity and confined within said first space in engagement with said first conductive layer and said housing for transmitting heat from said crystal to said housing; and

a second separate fluidic material having a predetermined thermal conductivity and confined within said second space in engagement with said second conductive layer and said housing for transmitting heat from said lamp to said housing.

4,601,039

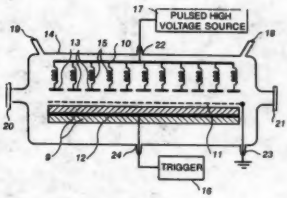
INDUCTIVELY STABILIZED, LONG PULSE DURATION TRANSVERSE DISCHARGE APPARATUS

Robert C. Sze, Santa Fe, N. Mex., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Sep. 1, 1983, Ser. No. 528,509

Int. Cl.[4] H01S *3/097*

U.S. Cl. 372—83 11 Claims



1. An apparatus for producing a stable transverse electric discharge in a rare-gas halide laser medium such that a population inversion suitable for lasing is caused to occur, said apparatus comprising in combination:

a. first, substantially planar elongated electrode having a plurality of segments wherein each of said segments is individually associated with one terminal of an inductive element, a second terminal of each of said inductive elements being brought into electrical contact thereby forming a common bus, the combined electrical impedance of said plurality of inductive elements being significantly less than the electrical impedance of the laser medium involved in the electric discharge;

b. a second substantially planar electrode spaced apart from said first electrode, said second electrode being disposed substantially parallel to said first electrode and being substantially coextensive therewith, said first electrode and said second electrode forming a first volume therebetween into which the laser medium can freely travel;

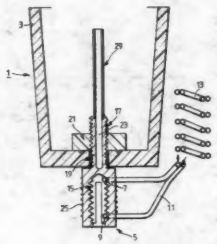
c. means for establishing a potential difference between said common bus and said second electrode suitable for producing a first, controlled, pulse electric discharge in the laser medium in the first volume; and

d. means for initiating the first electric discharge, whereby each of said inductive elements limits the rate of change of electric current passing through the electrode segment associated therewith, thereby significantly reducing the formation of arcs, whereby the combined inductance of said first electrode, said second electrode, said potential difference establishing means, said first electric discharge initiating means, and said plurality of inductive elements is sufficiently small that the first electric discharge takes place substantially within a time period of less than one microsecond, and whereby the quantity of electrical energy transferred to the laser medium is increased relative to that absorbed by said plurality of inductive elements.

4,601,040
CONDENSERS

Anthony J. Andrews; Keith H. Errey; Andrew J. Kearsley, and Colin E. Webb, all of Oxford, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 525,488, Aug. 22, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 684,084
Claims priority, application United Kingdom, Sep. 6, 1982, 8225307
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—57 17 Claims



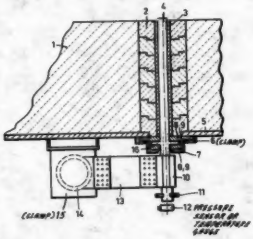
1. A condenser comprising:
an insulating vessel adapted for containing a refrigerant liquid and having a base with an aperture in it;
means for condensing gas to remove gaseous contaminates including a chambered body having a large thermal mass, located adjacent to the base of said insulating vessel, said chambered body having an inlet port and an outlet port adapted for respectively conveying an influent contaminated gas and an effluent purified gas;
means for conducting heat in a path between said chambered body and said refrigerant liquid and extending from said chambered body into said insulating vessel through said aperture in said base of said insulating vessel;
sealing means for preventing the egress of said refrigerant liquid through said aperture, said sealing means being located between said insulating vessel and said conducting means;
means for adjusting the temperature of said chambered body by changing the length of said path between said chambered body and said refrigerant liquid; and
heating means for regulating the temperature of said chambered body by electric heating.

4,601,041
ELECTRODE MOUNTING IN DC ARC FURNACE VESSELS

Norbert Müller, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed May 4, 1984, Ser. No. 607,381
Int. Cl.[4] H05B 7/00
U.S. Cl. 373—72 8 Claims

1. In a vessel for a dc arc furnace having a bottom with a refractory lining, there being a cooled electric current feeding structure arranged outside of the vessel underneath the bottom, and further including a plurality of electrode pins, the improvement comprising a separate mounting facility for each pin, including in each instance:
a bore in said lining;
an electrode pin in said bore having a collar;
fastening means disposed outside of the vessel bottom and secured thereto, said fastening means includes a sleeve releasably receiving said pin and holding said pin through its collar thereby mounting said pin to said bottom of said vessel;
means electrically insulating said pin from said vessel bottom;
a plurality of fireproof, perforated bricks in said bore of said lining receiving said pin; and

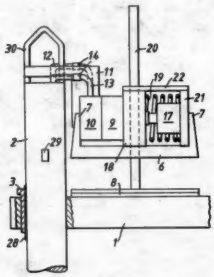


means connecting electrically said pin to said cooled current feeding structure.

4,601,042
ELECTRIC ARC FURNACES

Timothy Reynolds, Cumbria; Robert W. Montgomery; Harold Swaby, both of Sheffield, and Henry C. Garner, Mexborough, all of England, assignors to British Steel Corporation, Great Britain

Filed Apr. 3, 1984, Ser. No. 596,255
Claims priority, application United Kingdom, Apr. 7, 1983, 8309469
Int. Cl.[4] H05B 7/101
U.S. Cl. 373—93 15 Claims

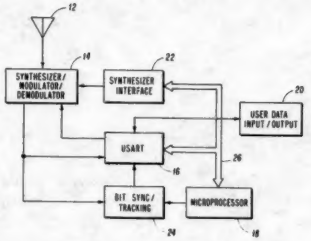


1. Apparatus for selectively connecting an electrode of an electric arc furnace to a source and receiver of cooling fluid, the apparatus including a coupling having passageways extending therethrough for the flow of cooling fluid and comprising at least two separable sections, one such section being connected to receive cooling fluid from the source and the other to convey such cooling fluid to the electrode when coupled to the said one section, means operable to guide one separable section into close proximity to the other section, and means operable to clamp the assembled sections together to connect the electrode to the source of cooling fluid.

4,601,043
DIGITAL COMMUNICATIONS SOFTWARE CONTROL SYSTEM

Ivan E. Hardt, Cedar Rapids; Cynthia A. Bonebright, Marion, and Ray C. Fuller, Hiawatha, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 23, 1984, Ser. No. 613,665
Int. Cl.[4] H04K *1/00*
U.S. Cl. 375—1 **4 Claims**

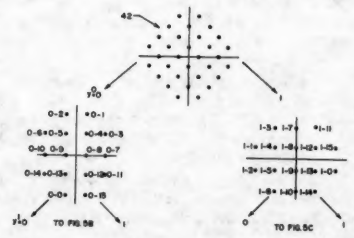


1. A frequency hopping communication system comprising:
means for receiving an input signal representing transmitted digital data having a synchronization portion and a message portion;
a bit sync tracking circuit coupled to receive said input signal and provide a sync signal output when synchronization with said input signal has been detected;
a universal synchronous/asynchronous receiver-transmitter coupled to receive said digital data and provide data to be transmitted and further responsive to said sync output for detecting character synchronization of said received data;
an input/output means for coupling data to and receiving data from said universal synchronous/asynchronous receiver-transmitter; and
a microprocessor coupled to said universal sychronous-/asynchronous receiver-transmitter and said tracking circuit to monitor synchronization and control data transfer between said universal synchronous/asynchronous receiver-transmitter and said input/out means and to reset said tracking circuit when character synchronization has not been detected by said universal synchronous/asynchronous receiver-transmitter within a specified time.

4,601,044
CARRIER-PHASE ADJUSTMENT USING ABSOLUTE PHASE DETECTOR

Philip F. Kromer, III, Winchester, Mass.; Rangarajan Srinivasagopalan, and Raul F. Fernandez, both of Miami, Fla., assignors to Racal Data Communications Inc., Miami, Fla.

Filed Nov. 4, 1983, Ser. No. 548,572
Int. Cl.[4] H04L *1/00, 7/00*
U.S. Cl. 375—17 **26 Claims**

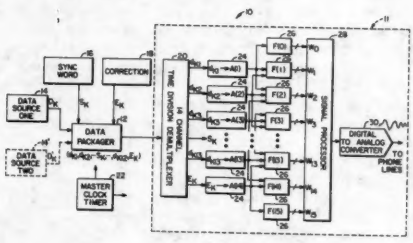


17. In a modulation-demodulation method for transmitting a plurality of information bit sequences including the steps of transforming by a coding process each of the information bit sequences into an expanded bit sequence having at least a coded bit group portion, subdividing a signal constellation of multilevel symbols into a plurality of subsets with each subset having at least one multilevel symbol, selecting one of the plurality of subsets in response to each sequentially applied coded bit group portion, modulating a carrier signal by one multilevel symbol from the selected subset to generate a modulated carrier signal for transmission, and demodulating and detecting a received modulated carrier signal to obtain a received expanded bit sequence having at least a received coded bit group portion, wherein the improvement comprises:
said step of subdividing including the step of arranging and identifying the subsets so that, when rotated in the complex plane by one of a plurality of adverse angular rotations, each said subset substantially maps upon a unique, predetermined subset other than itself for each of the adverse angular rotations; and
after said step of demodulating, uniquely identifying by analyzing a plurality of the received coded bit group portions each of said adverse angular rotation and 0° angular rotation.

4,601,045
MODULATOR-DEMODULATOR METHOD AND APPARATUS WITH EFFICIENT BANDWIDTH UTILIZATION

Daniel P. Lubarsky, San Jose, Calif., assignor to Larse Corporation, Santa Clara, Calif.

Filed Aug. 3, 1984, Ser. No. 637,362
Int. Cl.[4] H04B *15/00*
U.S. Cl. 375—38 **36 Claims**

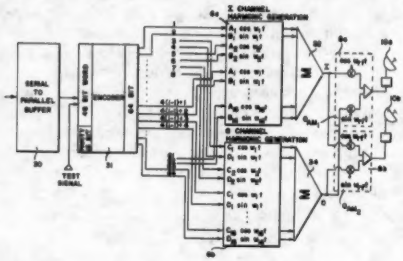


15. A method for modulating a signal for transmission over a transmission path comprising:
dividing a signal representing serialized bits of digital information into segments of equal length;
partitioning said segments into first digital words of equal length, each first digital word having a modulating value;
combining each of said first digital words of said segment with a plurality of digital preset channel frequency values to produce a plurality of second digital words, each of said second digital words corresponding to one of said channel frequency values modulated by a plurality of said modulating values;
processing all of said second digital words to construct a digital representation of an analog signal which is the superposition of a plurality of sinusoidal signals at said preset channel frequencies each having been modulated by said combination of said modulating values; and
converting said digital representation into an analog signal for transmission over said transmission path.

4,601,046
SYSTEM FOR TRANSMITTING DATA THROUGH A TROPOSCATTER MEDIUM

Peter H. Halpern, 118 Old Hickory Ct., Longwood, Fla. 32750; Peter E. Mallory, 406 N. Riverside Dr., Edgewater, Fla. 32032; Paul E. Haug, 5851 Michelle La., Sanford, Fla. 32771, and William M. Koos, Jr., 548 Lake Ave., Altamonte Springs, Fla. 32701

Filed May 15, 1984, Ser. No. 610,572
Int. Cl.[4] H04L *27/26*
U.S. Cl. 375—38 12 Claims



7. The method for transmitting and receiving binary data signals in serial form from one station to another through a troposcatter medium, comprising the steps of

(a) converting the serial data signals to parallel data signals;

(b) periodically inserting a channel test signal into said parallel data signals;

(c) generating sine and cosine harmonics for first and second groups of said parallel data signals, respectively, half of each of said sine and cosine harmonics generators being contained in one channel (I) and the remaining sine and cosine harmonics generators being contained in another channel (Q), each pair of sine and cosine harmonics generators in a given channel having a different harmonic frequency ($w_1 - w_{16}$), respectively, corresponding pairs of sine and cosine harmonics generators in the other channel having corresponding harmonic frequencies, respectively;

(d) adding the sine and cosine harmonics for each channel, thereby to define respective channel signals (S_I, S_Q);

(e) modulating said channel signals with radio frequency cosine and sine modulating signals, respectively, and for adding the cosine and sine modulated signals, thereby to produce resultant signals;

(f) transmitting said resultant rf signals; and

(g) receiving said transmitted signal and reproducing therefrom the original binary data signals.

4,601,047
CODE DIVISION MULTIPLEXER USING DIRECT SEQUENCE SPREAD SPECTRUM SIGNAL PROCESSING

Lawrence B. Horwitz, Alpharetta, and Eugene T. Wiggins, Dunwoody, both of Ga., assignors to Sangamo Weston, Inc., Norcross, Ga.

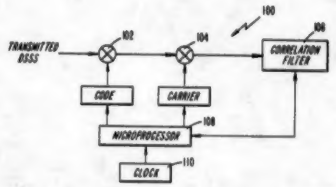
Filed Mar. 23, 1984, Ser. No. 592,669
Int. Cl.[4] H04L *9/00*
U.S. Cl. 375—2.2 8 Claims

1. A direct sequence spread spectrum code division multiplex system, comprising:

a timing signal source;

a plurality of transmitters synchronized to the timing signal source and each transmitting data spread by a bipolar pseudo-random code which is a different assigned shift of a common bipolar code sequence; and

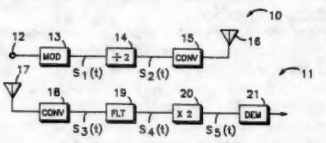
a receiver synchronized to said timing signal source for receiving said data signals and discriminating the signal transmitted by a predetermined transmitter spread by a bipolar pseudo-random code having a predetermined assigned code sequence shift from signals transmitted by the other transmitter, the receiver including means for generating a first bipolar pseudo-random code that is a replica of the transmitted common bipolar pseudo-random code and has the predetermined assigned code sequence shift, means for generating a second bipolar pseudo-random code that is a replica of the transmitted common bipolar pseudo-random code and has an unassigned code sequence shift, means for processing said first and second bipolar pseudo-random codes to obtain a trinary code sequence and means for cross-correlating said transmitted signals and said trinary sequence.



4,601,048
SERIAL MINIMUM SHIFT-KEYED MODEM

Carl R. Ryan, 13792 E. Pony La., Gilbert, Ariz. 85234

Filed Apr. 2, 1984, Ser. No. 596,117
Int. Cl.[4] H04L *27/10*
U.S. Cl. 375—47 4 Claims



1. An SMSK/2 (Serial Minimum Shift Keyed/2) apparatus comprising:

SMSK/2 modulator means for modulating a data signal, said SMSK/2 modulator means including:

an MSK (Minimum Shift Keyed) modulator coupled to receive said data signal and having a modulation index, said MSK modulator producing a modulated data signal;

divide-by-2 means for altering said modulation index of said MSK modulator, said divide-by-2 means being coupled to receive said modulated data signal from said MSK modulator means;

up converter means for increasing the frequency of said modulated data signal, said up converter means being coupled to said divide-by-2 means;

a first antenna coupled to said up converter means; and

SMSK/2 demodulator means for demodulating said data signal, said SMSK/2 demodulator means including:

down converter means for decreasing the frequency of said modulated data signal, said down converter means being coupled to receive said modulated data signal;

a matched filter coupled to said down converter means;

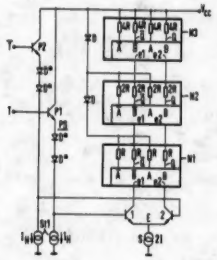
multiply-by-2 means for reconstructing said modulation index of said MSK modulator means, said multiply-by-2 means being coupled to said matched filter;

an MSK demodulator coupled to said multiply-by-2 means.

4,601,049
INTEGRABLE SEMICONDUCTOR CIRCUIT FOR A FREQUENCY DIVIDER

Wilhelm Wilhelm, and Zafer Incecik, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 27, 1984, Ser. No. 675,273
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1983, 3343573
Int. Cl.[4] H03K *23/00, 21/00*
U.S. Cl. 377—115 8 Claims



1. An integrable semiconductor circuit for a multistage frequency divider for use with a supply voltage and a constant current source comprising:

an input stage consisting of at least one differential amplifier connected to said constant current source and having control inputs to which respective input signals are supplied, and having at least two current outputs;

a first network forming a first divider stage consisting of a bistable circuit functioning as a master-slave flip-flop unit and having a master portion and a slave portion, said first network having first and second network inputs respectively connected to said current outputs of said input stage, said first network having two slave portion outputs and two master portion outputs;

a plurality of further networks forming successive divider stages each having a master portion and a slave portion the same as said first network, the respective first and second network inputs of each further network being connected to the slave outputs of the preceding network, said plurality of further networks including a last network having master outputs and slave outputs directly connected to said supply voltage; and

a plurality of bridging circuit elements respectively connected in parallel across each of said further networks and connected in series to said supply voltage, each bridging circuit element having a voltage drop thereacross matched to the voltage drop across the network bridged by said bridging circuit element, each bridging circuit element having a first terminal connected to said master outputs of a network preceding the network bridged by said bridging circuit element and having a second terminal connected to the master outputs of the network bridged by said bridging circuit element.

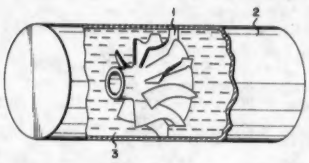
4,601,050
METHOD OF TESTING CERAMIC ARTICLE

Shun-ichiro Tanaka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 30, 1984, Ser. No. 615,272
Claims priority, application Japan, May 31, 1983, 58-96600
Int. Cl.[4] G21K *3/00*
U.S. Cl. 378—18 8 Claims

1. A method of testing a ceramic article comprising the steps of:

placing at least one portion of said ceramic article in a filling material selected from the group consisting of silicone oil, silicone rubber, and ceramic powder, and

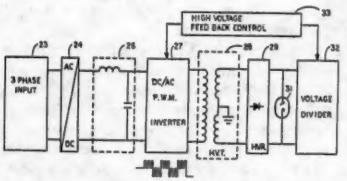


photographing said ceramic article by X-ray computed tomography.

4,601,051
PROTECTIVE CIRCUIT FOR X-RAY GENERATOR

Carlos M. Santurtûn, and Angel D. Carmena, both of Madrid, Spain, assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 22, 1983, Ser. No. 564,603
Int. Cl.[4] H05G *1/54*
U.S. Cl. 378—118 11 Claims



1. A high voltage system for an X-ray tube having an anode and a cathode comprising:

(a) a DC power source;

(b) a high voltage transformer having a primary winding and first and second secondary windings, said first secondary winding being connected to provide a positive voltage to the anode and said second secondary winding being connected to provide a negative voltage to the cathode, each voltage being referenced to a common ground potential;

(c) a full bridge transistor inverter connected for providing switched current to said primary winding from said DC source, said inverter having at least four transistors forming two current paths through said primary windings;

(d) control means for providing pulse-width modulated (PWM) gating signals to at least one of said transistors in each of said current paths;

(e) means for providing a signal representative of a desired voltage between the anode and cathode of the X-ray tube;

(f) means for providing first and second feedback signals representative, respectively, of the voltage at the anode and the cathode of the X-ray tube;

(g) means for combining said first and second feedback signals to obtain a summed signal representative of the anode to cathode voltage;

(h) means for comparing said summed signal to said desired voltage signal for generating an error signal for application to said control means such that said control means is effective to vary said PWM signals in a manner to minimize said error signal; and

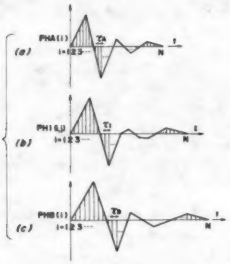
(i) means for comparing said error signal to a predetermined reference value and for inhibiting said PWM signals when said error signal exceeds said reference value.

4,601,052

VOICE ANALYSIS COMPOSING METHOD

Hiroshi Saito, Katano; Kiyotaka Nagai; Daisuke Mori, both of Hirakata; Masahiko Hatanaka, Moriguchi; Hideo Shibuya; Tomoaki Abe, both of Yokohama, and Minoru Toyoda, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 8, 1982, Ser. No. 447,899
Claims priority, application Japan, Dec. 17, 1981, 56-203932; Dec. 17, 1981, 56-203933; Dec. 17, 1981, 56-203934
Int. Cl.[4] G10L *1/00*
U.S. Cl. 381—51 10 Claims



1. A voice analysis and composing method comprising a voice analysis method including:

(a) a step of rendering a data number of phonemic data equal to a given data number in a phonemic piece for interpolation between two phonemic pieces;

(b) a step of composing phonemic piece data of the interpolation phonemic piece, by an interpolation operation, from the same data number value of the phonemic piece data of the phonemic piece preceding the phonemic piece to be interpolated and the succeeding phonemic piece;

(c) a step obtaining a phonemic piece data string of a phonemic piece group including the interpolation phonemic piece through insertion of the honemic piece data of said interpolation phonemic piece into the phonemic piece data of the phonemic piece data to be interpolated;

(d) a step of obtaining a difference phonemic piece data string through provision of the difference of the same-number data value of the adjacent phonemic piece data of said phonemic piece data string;

(e) a step of storing, in a memory, the lead phoenic piece data of said phonemic piece data string, and said difference phonemic piece data string, and a voice composing method including:

(f) a step of sequentially adding the difference phonemic piece data, read from said memory, to the lead phonemic piece data of the phonemic piece data string read from said memory so as to thereby obtain the phonemic piece data strings of the phonemic piece group including the interpolation phonemic pieces;

(g) a step of effecting the interpolation operation from the clock period of the phonemic piece preceding said phonemic piece to be interpolated and the clock period of the succeeding phonemic piece so as to thereby produce the clock period of the interpolation phonemic piece;

(h) a step of inserting the clock period of said interpolation-phonemic piece into the clock period of the phonemic piece to be interpolated to obtain the clock period strings of the phonemic piece group including the interpolation phonemic pieces, and

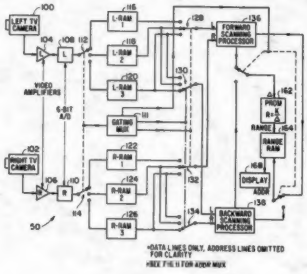
(i) a step of outputting, by said clock period string, the phonemic piece data string of the phonemic piece group including said interpolation phonemic pieces.

4,601,053

AUTOMATIC TV RANGING SYSTEM

Alex Grumet, Whitestone, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,623
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—1 37 Claims



1. A TV system for the automatic quantitative ranging on at least a single remote, non-cooperating, passive object comprising:

means for presenting a scene containing said object on a light-sensitive mosaic of a line-scannable image sensing means in the form of a pair of side-by-side split-screen stereo images of said scene;

means for scanning said mosaic in a horizontal sequence of scanning lines for successively analyzing the image energy along said scanning lines and deriving output signals proportional to the light energy of features of said stereo object images, each of said scanning lines having a predetermined number of scan points;

means for counting the scan points in each image of the stereo image pair in each scanning line to said features of said object in each scene from the left side of each image pair such that the parallax displacement Δ of corresponding object features in the two stereo images can be determined; and

means for processing said parallax displacements and producing an output indication of the range characterized by said parallax displacements.

4,601,054

PATTERN DISTANCE CALCULATING EQUIPMENT

Masao Watari, and Seibi Chiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 439,483, Nov. 5, 1982, abandoned. This application Jul. 23, 1985, Ser. No. 757,929
Claims priority, application Japan, Nov. 6, 1981, 56-178055
Int. Cl.[4] G06K *9/62;* G10L *5/06*
U.S. Cl. 382—1 12 Claims

1. A pattern distance calculating apparatus comprising:

an input pattern memory storing an input pattern comprised of a sequence of feature vectors each composed of a predetermined number n (i.e., a positive integer) of feature parameters;

a reference pattern memory storing a reference pattern comprised of a sequence of feature vectors each composed of n feature parameters of the same type as that of said input pattern;

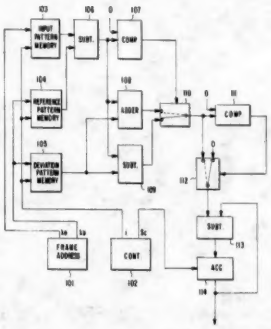
a deviation pattern memory storing a deviation pattern indicative of a predetermined fluctuation range for each of said n feature parameters of said reference pattern; and

distance calculating means for calculating a distance between said input pattern and said reference pattern, said distance calculating means comprising;

first means for determining if the difference between the

value of each feature parameter of said input pattern and the value of the corresponding feature parameter of said reference pattern is within the fluctuation range for said feature parameter of said reference pattern,

second means for selecting the value zero as a distance value if said difference is within said fluctuation range and for



selecting a distance value determined by a preselected distance calculating formula if said difference is outside said fluctuation range, and

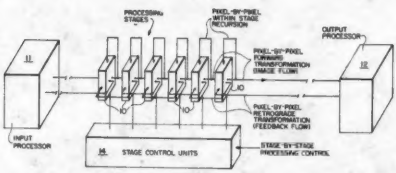
means for accumulating said distance values selected for each parameter to provide said distance between said input pattern and said reference pattern.

4,601,055

IMAGE PROCESSOR

Ernest W. Kent, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Apr. 10, 1984, Ser. No. 598,602
Int. Cl.[4] G06K *9/56, 9/36;* G06F *15/66*
U.S. Cl. 382—49 **15 Claims**



1. An image pre-processor for low-level iconic-to-iconic image processing system, said processor comprising:

a plurality of sequentially arranged, multiply interconnected processor stages each including means for storing multiple complete images;

means providing a forward path connection between adjacent stages of said plurality of stages in sequence for transmitting complete processed images between those stages;

means providing backward path connections between adjacent stages of said plurality of stages in a reverse sequence to the forward path connections between the plurality of the stages for transmitting complete processed images between those stages; and

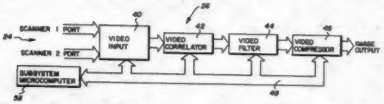
means providing a within stage recursive path connection for each stage of said plurality of stages wherein the output of the stage is connected back to an input to the stage for transmitting complete processed images between said output and said input of that stage.

4,601,056

VIDEO CORRELATOR FOR VIDEO FORMAT UNIT

Richard K. Habitzreiter, Dallas; Robert V. Pinney, Jr., Fort Worth, and Rodney K. Guthmueller, Lewisville, all of Tex., assignors to Recognition Equipment Incorporated, Irving, Tex.

Filed Aug. 13, 1984, Ser. No. 640,347
Int. Cl.[4] G06K *9/62*
U.S. Cl. 382—50 **2 Claims**



1. A video correlator for use in an image processing system wherein video data representative of a document image or portions thereof is received in a gray level data format in which the image is composed of a plurality of cells for enhancing the black/white characterization of each cell, comprising:

means for comparing a cell's gray level data with the average gray level of a preselected number of surrounding cells; and

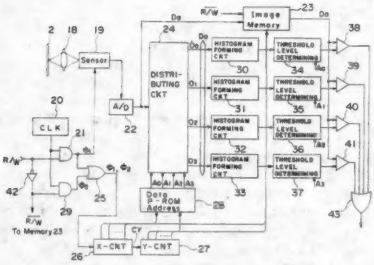
means for automatically selecting the number of surrounding cells for determining the average gray level.

4,601,057

PATTERN ANALYZER

Shuji Tsuji, Nagaokakyo; Hiroshi Ito, Ibaraki, and Kazuhiko Saka, Joyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 9, 1983, Ser. No. 559,922
Claims priority, application Japan, Dec. 10, 1982, 57-217366
Int. Cl.[4] G06K *9/38*
U.S. Cl. 382—51 **8 Claims**



1. A pattern analyzer comprising:

image pick-up means for picking up an image of a pattern at a plurality of sampling points and for producing a shade sample representing the depth of shade at each sampling point;

memory means for storing said shade signals;

classifying means for classifying said shade signals into different shade depths, with the result that a graph of the classified shade signals reaches a peak at two different shade depths;

threshold level determining means for determining a threshold level of shade depth between said two different shade depths;

comparing means for comparing said shade signals stored in said memory means with said threshold level and for producing a 1-bit binary signal for each shade signal; and

distributing means for distributing said shade signals into a

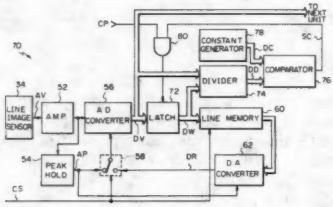
plurality of paths, each path carrying shade signals from a section of said image.

4,601,058

IMAGE READER FOR FACSIMILE APPARATUS OR THE LIKE

Toshio Seto, Zama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 742,094
Claims priority, application Japan, Jun. 12, 1984, 59-119064
Int. Cl.[4] G06K *9/38*
U.S. Cl. 382—52 **4 Claims**



1. An image reading device for storing output signals of a line image sensor, comprising:

a line memory for storing as reference signals, the output signals pixel by pixel of said line image sensor while reading a reference white image and using said stored reference signals to shade the output of said line image sensor while reading a document;

latch means for temporarily storing an output of the line image sensor of a pixel;

computing means for computing a variation between an output of the line image sensor representative of a particular pixel and an output of the line image sensor representative of a pixel which immediately precedes said particular pixel stored in said latch means, and generating an output indicative of a result of the computation;

constant generator means for producing a signal indicative of a predetermined variation ratio; and

decision means for determining that the variation computed by said computing means has exceeded said predetermined variation ratio, said decision means being responsive to the output of the computing means and said constant generator signal to generate a decision output signal;

logic means connected to said decision means and said latch means for receiving said decision output signal and producing a latch control signal in response thereto for controlling the storage of a pixel signal in said latch means;

said line memory receiving and storing a pixel signal from said latch means, said pixel signal being the reference signal of the particular pixel when said control signal is in a first state and said pixel signal being the reference signal of the pixel immediately preceeding said particular pixel in place of the reference signal for said particular pixel when the control signal is in a second state.

4,601,059

COMMUNICATIONS CONTROL CIRCUIT WITH ADAPTIVE TIMING

Robert S. Gammenthaler, 2030 Avenue G., Suite 1108, Plano, Tex. 75074

Filed Apr. 2, 1984, Ser. No. 595,912
Int. Cl.[4] H04B *1/00*; H04Q *7/00*
U.S. Cl. 455—54 **15 Claims**

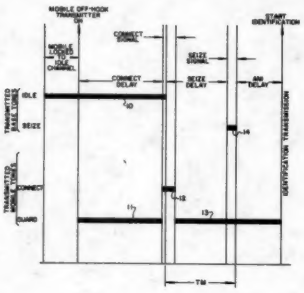
1. A communications unit comprising:

receiver means for receiving transmissions of a first and second frequency;

transmitting means for transmitting a response signal;

timing means for measuring a plurality of time intervals, each time interval being the time from the end of the transmission of the first frequency to the end of the transmission of the second frequency; and

logic means for actuating said transmission means after a computed time delay from the end of the transmission of



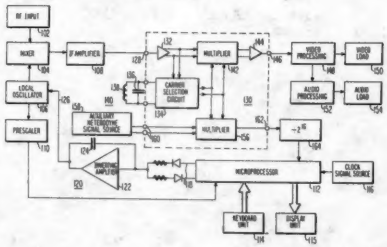
the first frequency, said time delay being computed by said logic means as a function of the time interval measurements, whereby the time of transmission of the response signal after receipt of said transmission of the second frequency is determined by the time interval between the transmission of said first and second frequencies.

4,601,060

AUTOMATIC DIGITAL FINE TUNING SYSTEM

Charles M. Wine, Princeton Borough, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1984, Ser. No. 664,418
Int. Cl.[4] H04B *1/26*; H04N *5/50*
U.S. Cl. 455—192 **7 Claims**



1. Apparatus for fine tuning a superheterodyne receiver for receiving a radio frequency (RF) signal, said receiver including controllable local oscillator (LO) means for producing a local oscillator signal and having a control input; mixer means for mixing said local oscillator signal and said RF signal for providing an intermediate frequency (IF) signal; IF amplifier means for processing said IF signal; and automatic fine tuning (AFT) control means for automatically controlling said LO means so as to reduce a frequency deviation between said IF frequency and a predetermined nominal IF frequency, said automatic fine tuning control means comprising:

auxiliary heterodyne oscillator means for providing a heterodyning signal;

carrier selective filter means coupled to said IF amplifier means for deriving a carrier representative signal at the IF carrier frequency;

signal multiplier means coupled to said heterodyne oscillator means and said carrier selective filter means for producing

an offset frequency signal proportional to a difference in frequency between said carrier representative signal and said auxiliary heterodyning signal;

a source of a clock signal; and

control means coupled to said signal multiplier means for receiving said offset frequency signal and to said source of a clock signal for receiving said clock signal for applying a control signal representative of said difference frequency to said controllable LO means control input in a sense to reduce said frequency deviation.

4,601,061

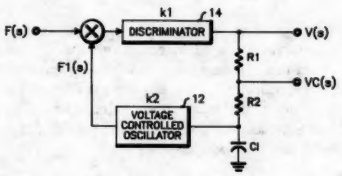
AUTOMATIC FREQUENCY CONTROL CIRCUIT HAVING AN EQUALIZED CLOSED LOOP FREQUENCY RESPONSE

Scott N. Carney, Hoffman Estates, and Donald L. Linder, Palatine, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jul. 2, 1984, Ser. No. 627,159

Int. Cl.⁴ H04B *1/26*

U.S. Cl. 455—208 **6 Claims**



1. In a circuit having a detector for recovering information carried by a signal of a predetermined frequency applied to the detector and an automatic frequency control (AFC) circuit including means for varying the frequency of the signal applied to the detector in response to an error signal, and means responsive to the recovered information for generating the error signal which causes said varying means to adjust the frequency of the signal applied to the detector to be said predetermined frequency, the detector, generating means, and varying means defining a closed loop circuit having a closed loop frequency response, the improvement comprising:

said generating means including a single means for low pass filtering said information to produce the error signal and for simultaneously compensating the frequency response of the recovered information so that it is independent of said closed loop frequency response, said single means having one output carrying said error signal and another output carrying said compensated recovered information.

4,601,062

TRACKING IMAGE FREQUENCY TRAP

James Hettiger, Marion County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 705,496

Int. Cl.⁴ H04B *1/10, 15/00*

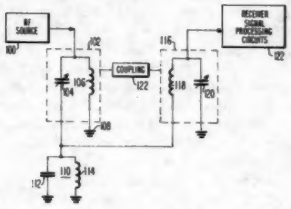
U.S. Cl. 455—285 **21 Claims**

1. In a superheterodyne radio frequency (RF) receiver having an RF signal input port and exhibiting an undesired image frequency response when tuned to a desired signal frequency, an RF coupling arrangement comprising:

first and second resonant circuit means each comprising respective parallel-connected capacitive and inductive branches, said first resonant circuit means being coupled to said input port for receiving a signal at said input port;

first coupling means for mutually coupling said first and second resonant circuit means;

impedance means coupled in series with said capacitive branch of said first resonant circuit means for providing a neutralizing signal; and



second coupling means for coupling at least a portion of said neutralizing signal into said inductive branch of said second resonant circuit means.

4,601,063

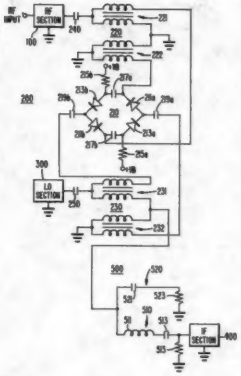
DOUBLY-BALANCED MIXER TERMINATION

Timothy W. Price, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 705,499

Int. Cl.⁴ H04B *1/12*

U.S. Cl. 455—317 **6 Claims**



1. A tuner for receiver comprising:

an input for receiving RF signals corresponding to various channels;

RF means for selecting the RF signal corresponding to a selected channel;

local oscillator means for generating a local oscillator signal having a frequency corresponding to the selected channel;

mixer means for combining said selected RF signal and said local oscillator signal to produce an output signal at an output having sum and difference frequency components;

IF means having an input coupled to the output of said mixer means and having a predetermined passband;

said local oscillator signal being controlled so that said difference frequency component is within said passband;

sum frequency component termination means coupled to said output of said mixer means for terminating said output of said mixer substantially in its characteristic impedance including a capacitor and a resistance element connected in series between said output of said mixer and a point of reference potential, said resistance element having a resistance value substantially equal to that of said characteristic impedance of said mixer, said capacitance having a

value such that it has a negligible impedance in the frequency range between the highest frequency of said difference frequency component and the lowest frequency of said sum frequency component; and

difference frequency component termination means for terminating said output of said mixer substantially in its characteristic impedance including an inductor and a capacitor and a resistance element coupled in series between said output of said mixer and said point of reference potential, said resistance element having a resistance value substantially equal to that of said characteristic impedance of said mixer, said series coupling of the said inductor and said capacitor forming a tuned circuit having a resonance at a frequency within said passband of said IF means.

4,601,064

COMMUNICATION SYSTEM

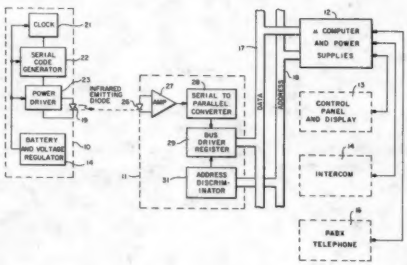
Robert T. Shipley, Walnut Creek, Calif., assignor to Fisher Berkeley Corporation, Emeryville, Calif.

Continuation of Ser. No. 457,692, Jan. 13, 1983, abandoned, which is a continuation of Ser. No. 194,038, Oct. 6, 1980, abandoned. This application Oct. 3, 1984, Ser. No. 658,052

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—608 **24 Claims**

1. In a personnel locating system for use in a facility having a plurality of rooms having doorways therein, a plurality of portable transmitters, each including a battery and each generating automatically and repetitively a unique signal consisting of pulses of infrared radiation, a plurality of fixed receivers positioned to cover different rooms at a facility, each room having a receiver therein positioned to accept infrared radiation from a substantial portion of the volume of the room, each receiver being capable of repetitively sensing and storing any of said unique signals generated by said transmitters during the entire time said transmitters are located anywhere in the facility including when located within a room, means for polling said receivers to determine which of said unique signals are



stored at said receivers to ascertain repetitively the location and identity of each transmitter in each room and means associated with the transmitters for ensuring that the locations and identities of any of said transmitters will not be lost at any time even though occasional collisions of the unique signals from said transmitters may occur.

284,612

HELMET

Anthony G. Gorman, Ruislip, England, assignor to Racal Acoustics Limited, Wembley, England

Filed Jul. 19, 1983, Ser. No. 515,162

Claims priority, application United Kingdom, Feb. 2, 1983, 1011219; Feb. 2, 1983, 1011220

Term of patent 14 years

U.S. Cl. D2—232

284,613

CROSS-COUNTRY SKI BOOT

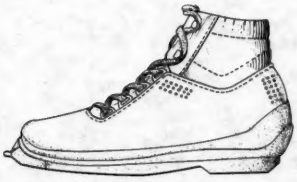
Jean-Francois Bernault, Annecy, France, assignor to Salomon S.A., Annecy, France

Filed Mar. 2, 1984, Ser. No. 585,539

Claims priority, application France, Sep. 2, 1983, 739

Term of patent 14 years

U.S. Cl. D2—276



284,614

CROSS-COUNTRY SKI BOOT

Jean-Francois Bernault, Annecy, France, assignor to Salomon S.A., Annecy, France

Filed Apr. 20, 1984, Ser. No. 602,335

Claims priority, application France, Oct. 25, 1983, 745

Term of patent 14 years

U.S. Cl. D2—276

284,615

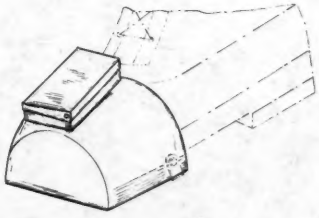
WARMING CAP FOR A SHOE OR BOOT

Harold E. Rock, R.R. 2, Box 452, Berrien Springs, Mich. 49103, and Stephen E. Palen, R.R. 1, Box 185, New Buffalo, Mich. 49117

Filed Jun. 8, 1982, Ser. No. 386,222

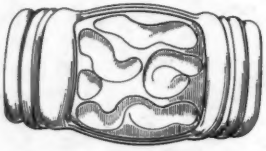
Term of patent 14 years

U.S. Cl. D2—277



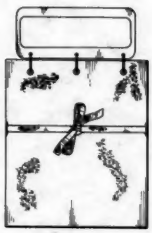
284,616
OUTSOLE
Robert J. Gamm, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Apr. 6, 1983, Ser. No. 482,475
Term of patent 14 years
U.S. Cl. D2—320

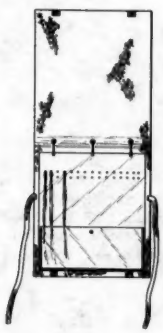
284,617
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon, New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,700
Term of patent 14 years
U.S. Cl. D2—405



284,618
UMBRELLA BOOT HOLDER
Stella St. John, Enterprise Coast Rd., Christ Church, Barbados
Filed Jul. 22, 1983, Ser. No. 516,458
Term of patent 14 years
U.S. Cl. D3—5

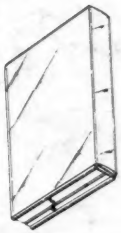
284,619
FOLDABLE THREAD STORAGE AND ORGANIZER DEVICE
Carolyn S. Muradian, 8804 Verbena Dr., Little Rock, Ark. 72209
Filed Mar. 19, 1984, Ser. No. 591,105
Term of patent 14 years
U.S. Cl. D3—20

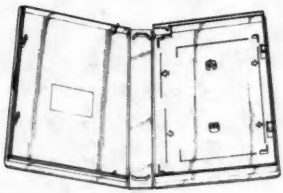




284,620
BACKPACK COOLER
Dennis Calton, 6881 Estrella, San Diego, Calif. 92120
Filed Nov. 30, 1983, Ser. No. 556,399
Term of patent 14 years
U.S. Cl. D3—32

284,621
TAPE CASSETTE HOLDER
Rodney S. Swinney, Cragside Park House, Rothbury, Northumberland NE657PU, England
Filed Feb. 23, 1983, Ser. No. 468,880
Claims priority, application United Kingdom, Aug. 24, 1982, 1008427
Term of patent 14 years
U.S. Cl. D3—35

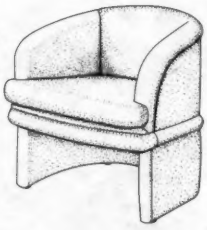




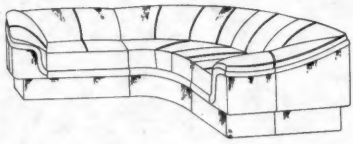
284,622
GUN CASE FOR A REVOLVER OR THE LIKE
William H. Durbin, P.O. Box 416, Redwood City, Calif. 94064
Filed Jun. 28, 1982, Ser. No. 392,550
Term of patent 14 years
U.S. Cl. D3—38

284,623
COMBINED ORGANIZER TOTE AND BRIEFCASE
Edward L. Gerch, Chicago, Ill., assignor to Kingport, Ltd., Evanston, Ill.
Filed May 2, 1984, Ser. No. 606,386
Term of patent 14 years
U.S. Cl. D3—48

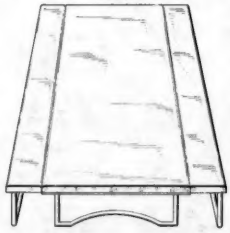
284,624
CHAIR
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 17, 1983, Ser. No. 542,782
Term of patent 14 years
U.S. Cl. D6—371



284,625
SOFA OR SIMILAR ARTICLE
Randy R. Culler, High Point, N.C., assignor to Carson's, Inc., High Point, N.C.
Filed Oct. 25, 1985, Ser. No. 791,451
Term of patent 14 years
U.S. Cl. D6—381



284,626
BED
Gerd Johansson, Pyrolavägen 32, S-181 60 Lidingö, Sweden, assignor to Gerd Johansson, Sweden
Filed Oct. 25, 1983, Ser. No. 544,821
Claims priority, application Sweden, Apr. 26, 1983, 83-1167
Term of patent 14 years
U.S. Cl. D6—383

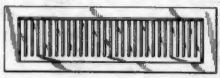


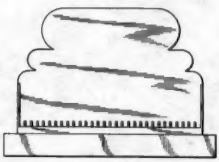
284,627

DISPLAY STAND FOR SOFTWARE DISCS OR THE LIKE

John F. Burchill, 127 Pleasure Ave., Lake Ronkonkoma, N.Y. 11779

Filed Jan. 30, 1984, Ser. No. 574,853
Term of patent 14 years
U.S. Cl. D6—407



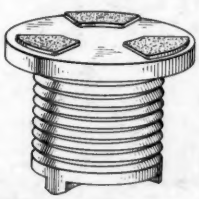


284,628

ADJUSTABLE SUPPORT STAND FOR AN ELECTRONIC DEVICE

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; John K. Westberg, II, and Peter F. Stultz, both of Elgin, Ill., assignors to James P. Liautaud, Cary, Ill.

Filed Sep. 6, 1983, Ser. No. 529,857
Term of patent 14 years
U.S. Cl. D6—429

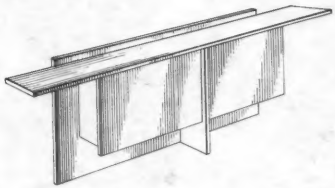


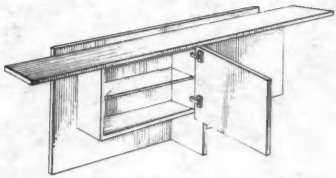
284,629

CREDENZA

Demir Hamami, 4938 Battery La., Apt. 5, Bethesda, Md. 20814

Filed Apr. 27, 1984, Ser. No. 604,388
Term of patent 14 years
U.S. Cl. D6—445



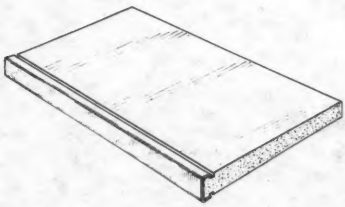


284,630

SHELF

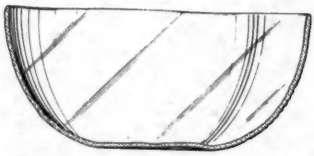
Irwin J. Ferdinand, Glencoe, Ill., assignor to Hirsh Company, Skokie, Ill.

Filed Nov. 22, 1983, Ser. No. 554,307
Term of patent 14 years
U.S. Cl. D6—511

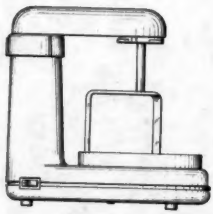


284,631
GOBLET OR SIMILAR ARTICLE
David H. Inns, Retford, England, assignor to Glass Bulbs Limited, Chesterfield, England
Filed Sep. 26, 1983, Ser. No. 535,986
Claims priority, application United Kingdom, May 12, 1983, 1012993
Term of patent 14 years
U.S. Cl. D7—13

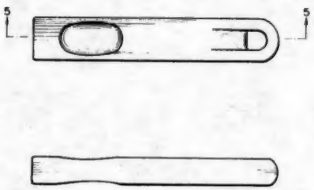
284,632
BOWL OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France
Filed May 9, 1984, Ser. No. 608,495
Term of patent 14 years
U.S. Cl. D7—24



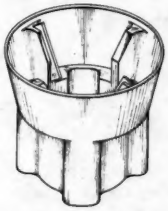
284,633
MIXING MACHINE FOR SAUCES
Claude Viancin, Rumilly, France, assignor to Vivalp, Rumilly, France
Filed Dec. 23, 1983, Ser. No. 565,040
Claims priority, application France, Jun. 24, 1983, 832581
Term of patent 14 years
U.S. Cl. D7—379



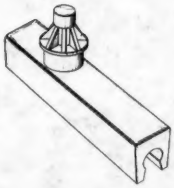
284,634
HANDLE FOR KITCHEN TOOLS OR THE LIKE
Toshio Sumikama, 15, Minami-machi 1-chome, Seki-shi, Gifu-ken, Japan
Filed Apr. 8, 1983, Ser. No. 483,150
Term of patent 14 years
U.S. Cl. D7—395



284,635
HAND ACTUATED VEHICLE RADIATOR CAP REMOVER
Frank D. Molnar, P.O. Box 884, Georgetown, Calif. 95634, and Claude Elliott, Jr., 331 Berthoud St., Sacramento, Calif. 95838
Filed Feb. 9, 1984, Ser. No. 578,740
Term of patent 14 years
U.S. Cl. D8—14

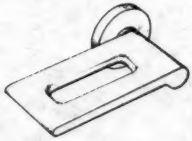


284,636
CHUCK KEY
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker Inc., Newark, Del.
Filed Jun. 23, 1983, Ser. No. 507,221
Term of patent 14 years
U.S. Cl. D8—21



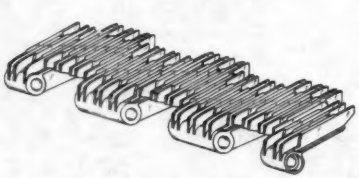
284,637
EXTRACTOR TOOL FOR PLASTIC RISERS
K. C. Erickson, Bountiful, and Doug McGregor, Salt Lake City, both of Utah, assignors to Pro-Mark, Inc., Bountiful, Utah
Filed Jul. 16, 1984, Ser. No. 631,253
Term of patent 14 years
U.S. Cl. D8—21

284,638
HANDLE
Gae Aulenti, Piazza San Marco, 4, Milan, Italy (20121)
Filed Feb. 15, 1984, Ser. No. 580,357
Claims priority, application Italy, Aug. 25, 1983, 22678 B/83[U]
Term of patent 14 years
U.S. Cl. D8—308



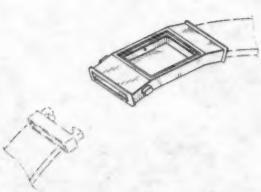
284,639
DOOR LOCK
Yoshihiko Matsuo, Kanagawa, and Takeshi Shohoji, Chiba, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Aug. 1, 1983, Ser. No. 519,346
Claims priority, application Japan, Feb. 17, 1983, 58-6293
Term of patent 14 years
U.S. Cl. D8—331

284,640
CONVEYOR CHAIN LINK
Roger H. Schroeder, Hartland; Robert J. Gladczak, Milwaukee, and Wasyly G. Hodlewsky, Greendale, all of Wis., assignors to Rexnord Inc., Brookfield, Wis.
Filed Jun. 28, 1983, Ser. No. 508,766
Term of patent 14 years
U.S. Cl. D8—499

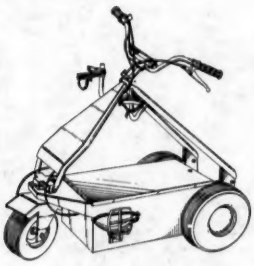


284,641
JUG
David A. Jones, Kettering, Ohio, assignor to The Drackett Company, Cincinnati, Ohio
Filed Sep. 12, 1983, Ser. No. 531,143
Term of patent 14 years
U.S. Cl. D9—341

284,642
WATCH CASE
Harumichi Kabaya, Yokohama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jul. 5, 1983, Ser. No. 511,008
Claims priority, application Japan, Apr. 13, 1983, 58 15320
Term of patent 14 years
U.S. Cl. D10—38



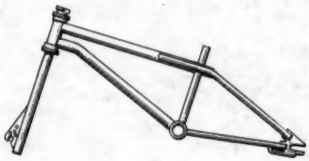
284,643
PORTABLE GOLF CAR
Arnold A. Pankow, 1201 Westmore, Wahpeton, N. Dak. 58075
Filed Sep. 7, 1983, Ser. No. 529,973
Term of patent 14 years
U.S. Cl. D12—16



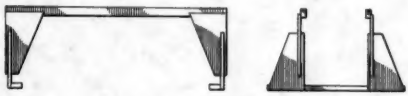
284,644
AUTOMOBILE
Werner Breitschwerdt, Stuttgart; Friedrich van Winsen, Kirchheim, and Bruno Sacco, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Jun. 27, 1983, Ser. No. 508,242
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 5551
Term of patent 14 years
U.S. Cl. D12—92

284,645
MINI TRUCK
David E. Hackett, 22366 Woodbluff Rd., El Toro, Calif. 92630, and Allan W. Buyze, 28132 Teton Ct., Laguna Niguel, Calif. 92677
Filed Oct. 12, 1983, Ser. No. 541,507
Term of patent 14 years
U.S. Cl. D12—98

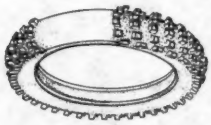
284,646
BICYCLE FRAME
Gary Turner, Santa Ana, Calif., assignor to GT BMX Products, Inc., Huntington Beach, Calif.
Filed Apr. 19, 1984, Ser. No. 602,038
Term of patent 14 years
U.S. Cl. D12—111



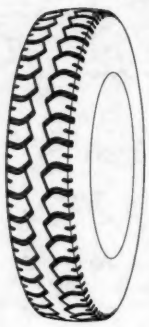
284,647
TRAINING WALKER FOR AN INFANT
Daniel R. Stockdell, 12 Mendelssohn St., Roslindale, Mass. 02131
Filed Jun. 14, 1984, Ser. No. 563,068
Term of patent 14 years
U.S. Cl. D12—130



284,648
TIRE
Werner Babl, Karlsfeld, and Ernst Mader, Munich, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 17, 1984, Ser. No. 601,264
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1983, 13605
Term of patent 14 years
U.S. Cl. D12—140



284,649
TIRE
Henry T. Kwee, Luxembourg, and René Goergen, Colmar-Berg, both of, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 21, 1983, Ser. No. 553,658
Term of patent 14 years
U.S. Cl. D12—147



284,650
TIRE
Ernst Mader, Munich, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany
Filed Apr. 17, 1984, Ser. No. 601,263
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1983, 13604
Term of patent 14 years
U.S. Cl. D12—147

284,651
SIDE VIEW MIRROR
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Mfg. Co. Ltd., Tokyo, Japan
Filed Sep. 19, 1984, Ser. No. 652,330
Claims priority, application Japan, May 30, 1984, 59-22149
Term of patent 14 years
U.S. Cl. D12—187

284,652
ADAPTER BASE FOR ELECTRIC LAMP
Herman J. Engel, 9832 Dungan Rd., Philadelphia, Pa. 19115
Filed Jul. 7, 1983, Ser. No. 511,740
[*] Notice. The portion of the term of this patent subsequent to Jul. 22, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—25

284,653
LIFE EXTENDER FOR INCANDESCENT LIGHT BULBS
Albert Matican, Westbrook, Conn., assignor to Lite-Life Incorporated, Westbrook, Conn.
Filed Nov. 21, 1983, Ser. No. 553,495
Term of patent 14 years
U.S. Cl. D13—25

284,654

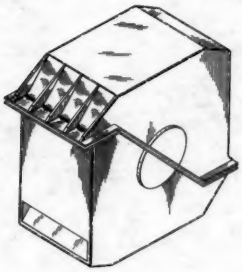
FILM CARTRIDGE OR SIMILAR ARTICLE

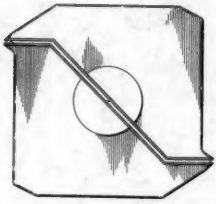
Donald R. Sandell, San Jose, and Karl K. Raadik, Fremont, both of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 7, 1983, Ser. No. 549,699

Term of patent 14 years

U.S. Cl. D14—11





284,655

HOUSING FOR COMBINED HANDSET AND STAND TELEPHONE UNIT

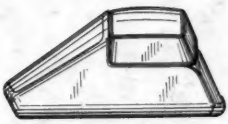
Eric J. Marshall, 5 Carlton Gardens, London SW1, England

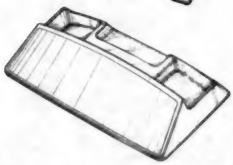
Filed Jun. 17, 1983, Ser. No. 505,528

Claims priority, application United Kingdom, Dec. 21, 1982, 1010430

Term of patent 14 years

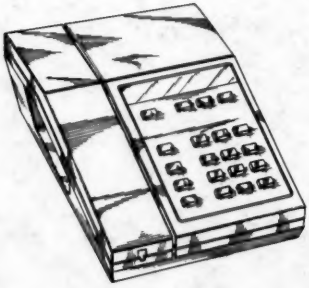
U.S. Cl. D14—53



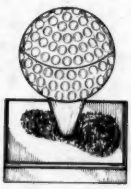


284,656
TELEPHONE
Peter Lee, 2nd Fl., 7 La. 93, Pao Ping Rd., YungHo City, Taipei Hsien, Taiwan
Filed Jul. 19, 1984, Ser. No. 632,538
Claims priority, application Taiwan, Apr. 25, 1984, 7331060
Term of patent 14 years
U.S. Cl. D14—53

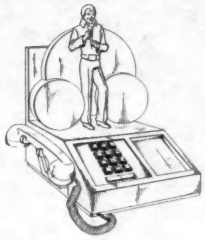
284,657
TELEPHONE SET
Eric J. Marshall, London, England, assignor to The Marshall Telephone Corporation Limited, Kent, England
Filed Dec. 9, 1983, Ser. No. 559,695
Claims priority, application United Kingdom, Jun. 10, 1983, 1013505
Term of patent 14 years
U.S. Cl. D14—53

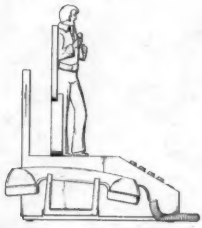


284,658
TELEPHONE STAND
Nedra R. Hazlett, 3804 Harwick Dr., Murrysville, Pa. 15668
Filed Mar. 19, 1984, Ser. No. 591,056
Term of patent 14 years
U.S. Cl. D14—60



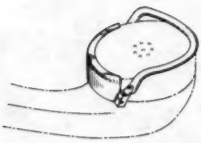
284,659
TELEPHONE
Charles R. Marlin, 9407 NW. 70th St., Grimes, Iowa 50313
Filed Apr. 20, 1984, Ser. No. 602,409
Term of patent 14 years
U.S. Cl. D14—53



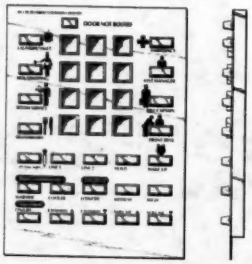


284,660
COMBINATION TELEPHONE SET
Douglas P. Montague, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Apr. 20, 1984, Ser. No. 602,392
Term of patent 14 years
U.S. Cl. D14—53

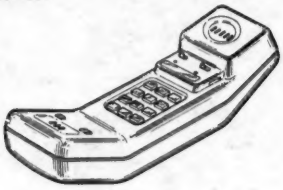
284,661
TELEPHONE EAR PIECE AID
Lynette R. White, Balmain, and Paul A. Cockburn, Paddington, both of Australia, assignors to Technical Aid to the Disabled, Ryde, Australia
Filed Aug. 24, 1983, Ser. No. 526,098
Claims priority, application Australia, Mar. 1, 1983, 3056/83
Term of patent 14 years
U.S. Cl. D14—57

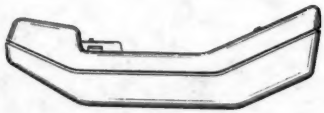


284,662
HOTEL TELEPHONE FACEPLATE
Robert H. McKenzie, Madison, and Anthony J. Fastaia, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Dec. 1, 1983, Ser. No. 557,720
Term of patent 14 years
U.S. Cl. D14—59

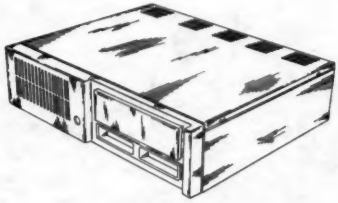


284,663
CORDLESS HANDSET TELEPHONE
David O. Edwards, and Brian Allars, both of Essex, England, assignors to British Telecommunications, London, England
Filed Sep. 26, 1983, Ser. No. 535,897
Claims priority, application United Kingdom, Mar. 25, 1983, 1,012,153
Term of patent 14 years
U.S. Cl. D14—53





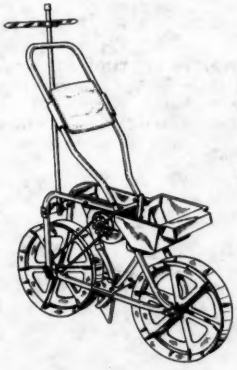
284,664
PERSONAL COMPUTER
Myron F. Davis; Willis Y. Jordan, III, both of Boca Raton, Fla.; Walter F. Kraus, LaGrangeville, N.Y., and Harold D. Yeaw, North Palm Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 7, 1983, Ser. No. 529,901
Term of patent 14 years
U.S. Cl. D14—100



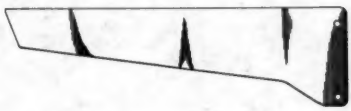
284,665
MAGNETIC DISC JACKET
Etsuro Saito; Tsuneo Nemoto; Tohru Ichikawa, and Shinichiro Takahashi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Oct. 24, 1983, Ser. No. 544,966
Claims priority, application Japan, Apr. 22, 1983, 58-17062
Term of patent 14 years
U.S. Cl. D14—114

284,666
ROTARY SPREADER
James D. Amerine, Marysville, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Apr. 27, 1984, Ser. No. 604,832
Term of patent 14 years
U.S. Cl. D15—13

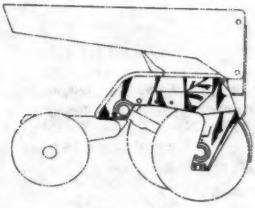
284,667
COMBINED WALK BEHIND SEEDER AND FERTILIZER
Dean A. Bliskey; Stephen K. Lambert, both of Greenville, and Thomas Kearnes, Akron, all of Ohio, assignors to Lambert Corporation, Ansonia, Ohio
Filed Aug. 23, 1984, Ser. No. 643,566
Term of patent 14 years
U.S. Cl. D15—13



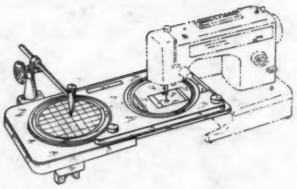
284,668
PLANTER ROW PANEL UNIT
Salley Gordon L., and Mark W. Wood, both of Moline, Ill., assignors to Deere & Company, Moline, Ill.
Filed Dec. 24, 1984, Ser. No. 685,523
Term of patent 14 years
U.S. Cl. D15—33



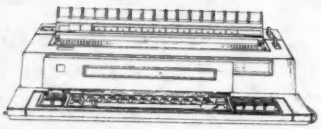
284,669
PLANTER ROW FRAME SUPPORT
Richard H. Clark, Blue Grass, Iowa; Barton L. Swales, Coal Valley, and Frank E. Ege, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.
Filed Dec. 24, 1984, Ser. No. 685,419
Term of patent 14 years
U.S. Cl. D15—33

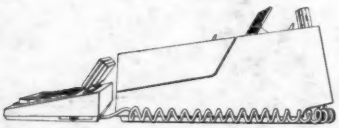


284,670
EMBROIDERY MACHINE
Yoshihide Yoneda, Hirakata, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Division of Ser. No. 506,972, Jun. 23, 1983. This application Jun. 25, 1985, Ser. No. 748,724
Claims priority, application Japan, Feb. 14, 1983, 58-5476; Feb. 15, 1983, 58-5750
Term of patent 14 years
U.S. Cl. D15—69

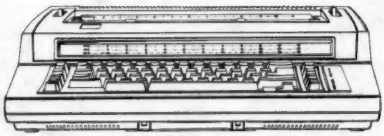


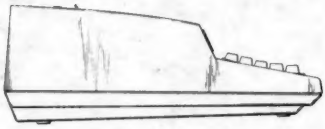
284,671
TYPEWRITER
Peter J. Mendel, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 29, 1984, Ser. No. 676,455
Term of patent 14 years
U.S. Cl. D18—1

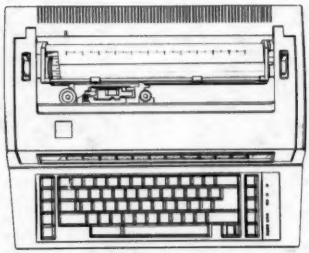




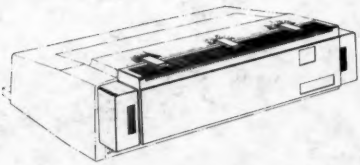
284,672
TYPEWRITER
Peter J. Mendel, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 28, 1984, Ser. No. 675,671
Term of patent 14 years
U.S. Cl. D18—1



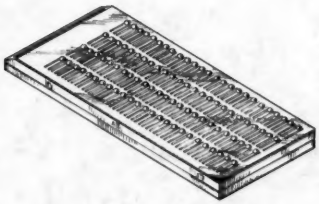




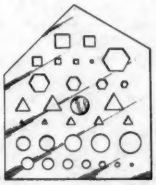
284,673
TYPEWRITER FEATURE ATTACHMENT
James P. Wang, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 3, 1984, Ser. No. 657,293
Term of patent 14 years
U.S. Cl. D18—12



284,674
LIST MARKING DEVICE
Eugene Vignerot, 9220 N. Julian Way, Westminster, Colo. 80030, and W. S. Law, 2 Village Rd., Englewood, Colo. 80110
Filed Sep. 8, 1982, Ser. No. 415,896
Term of patent 14 years
U.S. Cl. D18—14

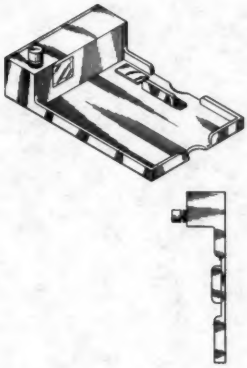


284,675
DRAFTING INSTRUMENT
David C. Ashley, 108 Dewitt Rd., Syracuse, N.Y. 13214
Filed Jun. 6, 1983, Ser. No. 501,589
Term of patent 14 years
U.S. Cl. D19—37

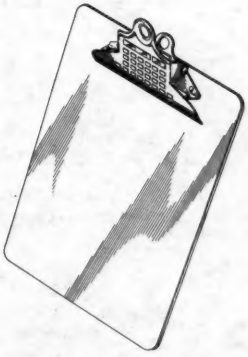


284,676
COMBINED WRITING INSTRUMENT AND CAP
Curtis L. Malm, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 29, 1984, Ser. No. 584,839
Term of patent 14 years
U.S. Cl. D19—51

284,677
ILLUMINABLE NOTE PAD AND PEN HOLDER
Joe E. Armijo, 42 Bridge Trail, Pueblo, Colo. 81005
Filed Jan. 9, 1984, Ser. No. 569,042
Term of patent 14 years
U.S. Cl. D19—78

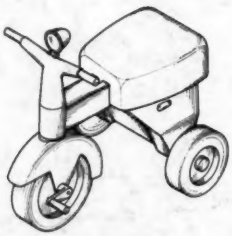


284,678
CLIPBOARD WITH AN INTEGRAL CALCULATOR
Ellis N. Shamoon, 4801 Lemmon Ave., Dallas, Tex. 75219
Filed Sep. 20, 1984, Ser. No. 652,516
Term of patent 14 years
U.S. Cl. D19—88



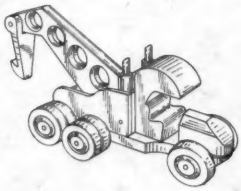
284,679
INFANT CAR SEAT TOY
James R. Livesey, Fountain Valley; Robert A. Tamura, Torrance, and Robert L. Cowell, Manhattan Beach, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 21, 1984, Ser. No. 581,939
Term of patent 14 years
U.S. Cl. D21—59

284,680
TOY TRICYCLE
Ta-Lung Wang, 1st Fl., No. 27, La. 432, Wu-Hsing St., Taipei, Taiwan
Filed Feb. 10, 1984, Ser. No. 579,071
Term of patent 14 years
U.S. Cl. D21—128



284,681
MODEL YACHT
Hironobu Sugihara, Hyogo, Japan, assignor to Kabushiki Kaisha A.G., Osaka, Japan
Filed Jan. 20, 1984, Ser. No. 572,897
Claims priority, application Japan, Jul. 27, 1983, 58-33001
Term of patent 14 years
U.S. Cl. D21—130

284,682
TOY TOW TRUCK
John Dorelli, 841 Williams St., Calumet City, Ill. 60409
Filed Apr. 2, 1984, Ser. No. 595,579
Term of patent 14 years
U.S. Cl. D21—139

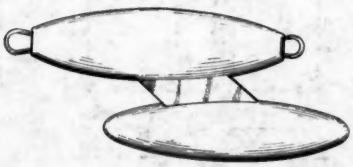


284,683
WRIST-MOUNTED TOY LAMB HEAD
Arlene Fabricant, Great Neck, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,260
Term of patent 14 years
U.S. Cl. D21—148

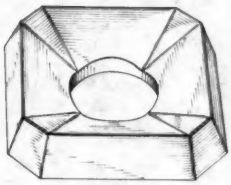
284,684
WRIST-MOUNTED TOY BEAR HEAD
Arlene Fabricant, Great Neck, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,259
Term of patent 14 years
U.S. Cl. D21—159

284,685
WRIST-MOUNTED TOY LION HEAD
Arlene Fabricant, Great Neck, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 2, 1984, Ser. No. 576,269
Term of patent 14 years
U.S. Cl. D21—163

284,686
FISHING TROLL WEIGHT
Dannie B. Hudson, 15 Scott Dr., Marlboro, N.J. 07751
Filed Nov. 14, 1983, Ser. No. 551,182
Term of patent 14 years
U.S. Cl. D22—145



284,687
ESCUTCHEON FOR PLUMBING FITTING
Donald W. Doman, Janesville, and William R. Davis, Kiel, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 28, 1983, Ser. No. 555,503
Term of patent 14 years
U.S. Cl. D23—31



284,688
MASSAGE SHOWER
Heinz G. Baus, Wartbodenstrasse 35, CH-3626 Hünibach/-Thun, Switzerland
Filed Apr. 28, 1983, Ser. No. 489,671
Claims priority, application Hague, Oct. 28, 1982, DM/001936
Term of patent 14 years
U.S. Cl. D23—57

284,689

CORNER FOR TUB SURROUNDS OR THE LIKE

E. Mackey King, West Olive, and Bryant L. Mitchell, Lake Orion, both of Mich., assignors to Abitibi-Price Corporation, Troy, Mich.

Filed Aug. 30, 1983, Ser. No. 527,693

Term of patent 14 years

U.S. Cl. D23—69

284,690

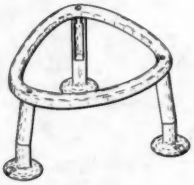
BABY SAFETY BATH RING

David J. Mandelbaum, 2867 Via Posada, La Jolla, Calif. 92037

Filed Mar. 7, 1984, Ser. No. 587,294

Term of patent 14 years

U.S. Cl. D23—69



284,691

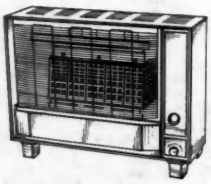
GAS HEATER

Yin-Sen Lee, 101 Jen Hua Rd., Ta-Li Hsiang, Taichung Hsien, Taiwan

Filed Jul. 7, 1983, Ser. No. 511,758

Term of patent 14 years

U.S. Cl. D23—92



284,692

COMBINED INHALATOR AND FACIAL TREATMENT VAPOR APPLICATOR MASK AND RESERVOIR

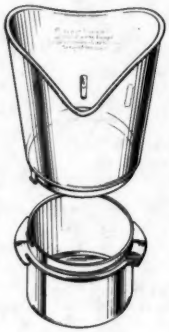
Horst D. Pohlmann, Maintal, Fed. Rep. of Germany, assignor to Degussa AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 440,591, Nov. 10, 1982, Pat. No. Des. 279,312. This application Jan. 10, 1983, Ser. No. 456,845

The portion of the term of this patent subsequent to Jun. 18, 1999, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—148



284,693

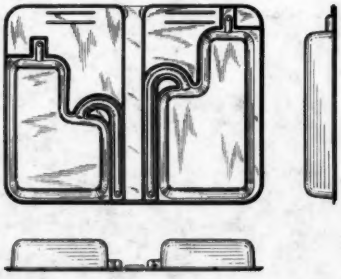
IN-TANK TOILET BOWL CLEANING DEVICE

Walter M. Ronayne, Westfield, N.J., assignor to American Home Products Corporation, New York, N.Y.

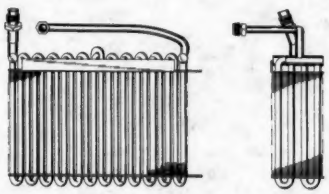
Filed Mar. 29, 1984, Ser. No. 594,611

Term of patent 14 years

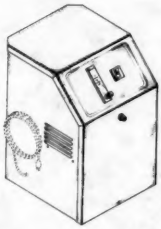
U.S. Cl. D23—150



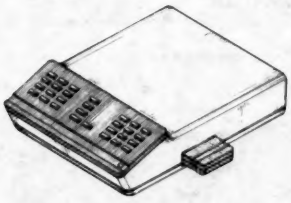
284,694
EVAPORATOR FOR AN AUTOMOTIVE AIR CONDITIONER
Shelton E. Taylor, 4112 Oakellar, Tampa, Fla. 33611
Continuation-in-part of Ser. No. 342,597, Jan. 25, 1982, and a continuation-in-part of Ser. No. 552,927, Nov. 18, 1983. This application Jun. 19, 1984, Ser. No. 622,211
Term of patent 14 years
U.S. Cl. D23—163



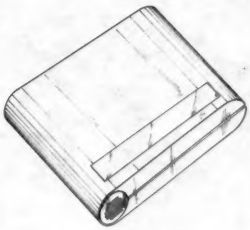
284,695
OXYGEN CONCENTRATOR
Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Inc., Tonawanda, N.Y.
Filed Nov. 1, 1983, Ser. No. 547,496
Term of patent 14 years
U.S. Cl. D24—1.1



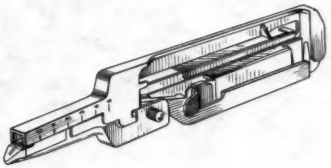
284,696
BIOFEEDBACK APPARATUS
Glenn S. Godden, Woodinville, and Michael D. Nelson, Seattle, both of Wash., assignors to Self Regulation Systems, Inc., Redmond, Wash.
Filed Dec. 9, 1983, Ser. No. 559,790
Term of patent 14 years
U.S. Cl. D24—8



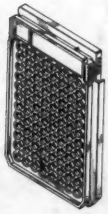
284,697
INFANT APNEA DETECTOR
Paul E. Brefka, South Borough, Mass., assignor to Briox Technologies, Inc., Worcester, Mass.
Filed Oct. 12, 1983, Ser. No. 541,134
Term of patent 14 years
U.S. Cl. D24—17



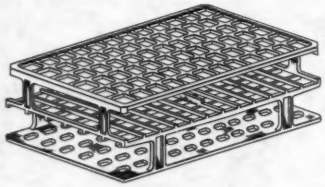
284,698
LATERAL ANASTOMOSIS SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Apr. 10, 1984, Ser. No. 598,784
Term of patent 14 years
U.S. Cl. D24—26



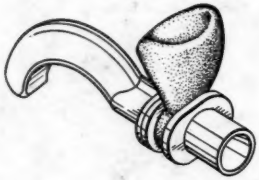
284,699
ASSAY CARTRIDGE
Michael E. Jolley, Round Lake, Ill., assignor to Pandex Laboratories, Inc., Mundelein, Ill.
Filed Jul. 15, 1983, Ser. No. 514,133
Term of patent 14 years
U.S. Cl. D24—29



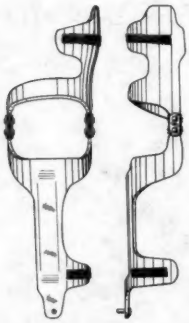
284,700
TEST TUBE RACK
Ravinder C. Mehra, Fairport, and Richard A. Leoncavallo, Pittsford, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Nov. 10, 1983, Ser. No. 550,575
Term of patent 14 years
U.S. Cl. D24—32



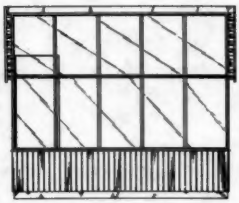
284,701
OROPHARYNGEAL TUBE WITH NARES OCCLUDER
R. Paul Deenadayalu, 298 Shadywood Dr., Dayton, Ohio 45415
Filed May 13, 1983, Ser. No. 494,368
Term of patent 14 years
U.S. Cl. D24—62

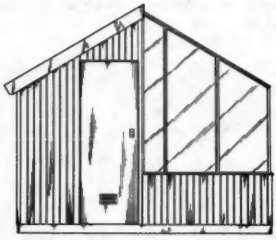


284,702
LEG BRACE
James D. Castillo, 22532 Tiermas, Mission Viejo, Calif. 92691
Filed Nov. 1, 1982, Ser. No. 438,282
Term of patent 14 years
U.S. Cl. D24—64



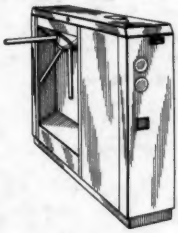
284,703
COMBINED TOOL AND GREENHOUSE
Bert Gustafsson, Rönnvägen 8, Nävragöl, 370 34 Holmsjö, Sweden
Filed Dec. 14, 1983, Ser. No. 561,576
Claims priority, application Sweden, Jun. 15, 1983, 1643/83
Term of patent 14 years
U.S. Cl. D25—15



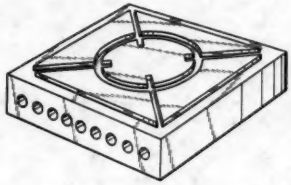


284,704
SLIDING GATE
Carola Malkmus-Dörnemann, Am Lappenspring 3, 3320 Salzgitter 51, Fed. Rep. of Germany
Filed Dec. 14, 1983, Ser. No. 561,585
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1983, MR No. 15
Term of patent 14 years
U.S. Cl. D25—50

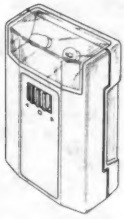
284,705
ENTRY GATE CABINET
Billy G. Smith, Lakeside, Calif., assignor to Cubic Western Data, San Diego, Calif.
Filed Dec. 28, 1983, Ser. No. 566,267
Term of patent 14 years
U.S. Cl. D25—51



284,706
BLOCK
Chang Y. Lee, 285-3, Yukgok-dong, Buchon, Kyungki-do, Rep. of Korea
Filed May 13, 1983, Ser. No. 494,564
Claims priority, application Rep. of Korea, Nov. 18, 1982, 10277-82
Term of patent 14 years
U.S. Cl. D25—80



284,707
PORTABLE LIGHT FOR VEHICLE
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Mfg. Co. Ltd., Tokyo, Japan
Filed Nov. 8, 1983, Ser. No. 550,012
Term of patent 14 years
U.S. Cl. D26—37



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Finkl & Sons Co.: *See*—
Lehman, Albert L.; and Finkl, Charles W., 4,600,427, Cl. 75-49.000.

A. Nattermann & Cie GmbH: *See*—
Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, 4,600,722, Cl. 514-367.000.

AB Volvo Penta: *See*—
Pichl, Heinz, 4,600,395, Cl. 440-61.000.

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Abbey, Nelson D., III, 4,600,180, Cl. 266-51.000.

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Sabo, Michael K.; and Johnson, Gary R., 4,600,120, Cl. 221-107.000.

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Abe, Akira, to Tomy Kokyo, Co. Inc. Sequential action toy having a plurality of cams. 4,600,399, Cl. 446-242.000.

Abe, Michiharu; and Oba, Hideaki, to Ricoh Co., Ltd. Optical information recording medium. 4,600,625, Cl. 428-167.000.

Abe, Tomoaki: *See*—
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.

Abegg, M. Taylor: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., 4,600,451, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,452, Cl. 149-19.300.

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Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,600,724, Cl. 514-510.000.

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Krohn, William T.; McNally, Mark J.; and Abreu, Rene, 4,600,307, Cl. 356-346.000.

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Cramer, Wilhelm; and Schrewe, Manfred, 4,600,664, Cl. 429-7.000.

ACF Industries, Incorporated: *See*—
Randolph, Robert W., 4,599,948, Cl. 105-282.00P.

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Yoshimura, Shohei; and Adachi, Akira, 4,600,636, Cl. 428-304.400.

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Adolph Coors Company: *See*—
Bader, James S., 4,599,848, Cl. 53-398.000.

Adorian, Iudita L.: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

Adventure Enterprises, Inc.: *See*—
Rinke, Robert M., 4,599,835, Cl. 52-184.000.

AE/CDS Autoclave, Inc.: *See*—
Linwood, Gary C.; and Laragione, Robert, 4,600,827, Cl. 219-492.000.

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Graham, Neil A., 4,599,772, Cl. 29-156.50R.

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Torisaka, Yasunori; Ohuchi, Kiyoyuki; and Nakazawa, Yoshinori, 4,600,446, Cl. 148-2.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Strauss, Jurgen; Runzheimer, Hans-Volker; and Wolfrum, Gerhard, 4,600,681, Cl. 430-242.000.

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Sels, Francis J.; Paulussen, Josephus F.; and Pollet, Robert J., 4,600,552, Cl. 264-300.000.

Agius, Lewis. Bowlers aid. 4,600,191, Cl. 273-54.00B.

Agnelli, Frank J., to E. J. Brooks Company. Connection nut seal with means for allowing test of integrity. 4,600,220, Cl. 285-80.000.

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Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.

Ahrens, Kurt H.: *See*—
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.

Aid, James D., to Baxter Travenol Laboratories, Inc. Reverse osmosis water purification module. 4,600,512, Cl. 210-433.200.

Aigo, Seiichiro. Treatment basin for semiconductor material. 4,600,463, Cl. 156-345.000.

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Aiken, John A., Jr., to International Business Machines Corporation. Zone partitioning in volume recovery system. 4,601,012, Cl. 364-900.000.

Aine, Harry E.; and Block, Barry, to Aine, Harry E.; and Block, Barry. Method of undercut anisotropic etching of semiconductor material. 4,600,934, Cl. 357-26.000.

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Frei, Willi, 4,600,561, Cl. 422-170.000.

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Hirosawa, Koichiro, 4,599,916, Cl. 74-689.000.

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Mogensen, Gregers E., 4,600,303, Cl. 356-73.100.

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Karmen, Arthur; and Lasky, Fred D., 4,600,690, Cl. 435-7.000.

Alco Chemical Corporation: *See*—
Ruffner, Charles G.; and Wilkerson, John M., III, 4,600,761, Cl. 526-270.000.

Alcon Laboratories, Inc.: *See*—
York, Billie M., Jr., 4,600,717, Cl. 514-278.000.

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MacKeighen, Harold R.; and Cortesi, Vincent T., 4,600,728, Cl. 521-84.100.

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Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,600,243, Cl. 303-92.000.

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Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,600,779, Cl. 548-135.000.

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Allen, Alfred L.: *See*—
Robbins, Frederick M.; Allen, Alfred L.; Walker, John E.; and Cohen, Samuel H., 4,600,589, Cl. 426-56.000.

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Califano, Herbert T.; Schuchardt, James M.; and Spindler, Gotthard K., 4,600,166, Cl. 244-3.160.
Lobsinger, James R.; Sweet, Steven R.; and Natter, Eckard F., 4,600,924, Cl. 343-17.10R.
Novotny, Joseph, 4,600,558, Cl. 422-7.000.
Pauwels, Michael A.; and Wright, Danny O., 4,600,993, Cl. 364-431.050.

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Willetts, Charles A., 4,600,179, Cl. 256-67.000.

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Mayo, Howard A., Jr., 4,599,854, Cl. 60-398.000.
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Ellis, Darwin L.; and Kelly, Frank M., 4,599,846, Cl. 53-331.500.
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Hepworth, Malcolm T.; and Wicker, Gordon R., 4,599,955, Cl. 110-347.000.
Wiegers, Ben W.; Chou, Eddie C. J.; Bruno, John D.; and Leaver, Helen S., 4,600,435, Cl. 75-119.000.

Amerace Corporation: *See*—
Stepniak, Frank M.; and Kominiak, Andrew A., 4,600,260, Cl. 339-111.000.

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Lin, Song-Ling; and Park, Moo-Kwang, 4,600,575, Cl. 424-45.000.
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American Meter Company: *See*—
Hicks, Irwin A.; and Schroeck, Joseph P., 4,600,923, Cl. 340-870.020.

American Optical Corporation: *See*—
Maryyanek, Richard D.; and Zdrok, Joseph Z., 4,600,002, Cl. 128-206.190.

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Fisher, Kenneth J.; and Miller, William R., 4,600,979, Cl. 362-373.000.

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Willson, James R., 4,600,909, Cl. 335-133.000.

Amoco Corporation: *See*—
Broding, Robert A., 4,601,024, Cl. 367-86.000.

Amornraksa, Kitti: *See*—
Grigg, Ronald E.; and Amornraksa, Kitti, 4,600,025, Cl. 131-335.000.

Amos, Matthew P. Line guide. 4,599,804, Cl. 33-408.000.

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Feldman, Steven; and Kimmel, David J., 4,600,810, Cl. 179-175.30R.
Olsson, Billy E., 4,600,259, Cl. 339-99.00R.
Rose, William H.; and Shaffer, David T., 4,600,971, Cl. 361-421.000.

Analytical Products, Inc.: *See*—
Smernoff, Ronald B., 4,600,697, Cl. 436-174.000.

Anamet, Inc.: *See*—
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., 4,599,784, Cl. 29-450.000.

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Ando, Yukito: *See*—
Asai, Akio; Ando, Yukito; and Kirii, Kazunari, 4,599,887, Cl. 72-453.130.

Andreas Stihl: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

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Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.

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Evans, John M.; and Wise, Colin C., 4,600,015, Cl. 128-780.000.

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Arakawa, Hideki; and Kawashima, Hiromi, to Fujitsu Limited. Semiconductor memory device. 4,601,020, Cl. 365-226.000.

Arakawa, Kohsaku: *See*—
Mizutani, Akihiko; Murayama, Hiroyoshi; Arakawa, Kohsaku; and Tanaka, Saburo, 4,600,513, Cl. 210-712.000.

Araki, Hideo; and Matsunaga, Chiharu, to Toshiba Kikai Kabushiki Kaisha. Hydraulic apparatus used for operating vehicles. 4,599,856, Cl. 60-421.000.

Arango, Aurelia, to Arango, Miguel A. Toothpaste extractor. 4,600,126, Cl. 222-82.000.

Arango, Miguel A.: *See*—
Arango, Aurelia, 4,600,126, Cl. 222-82.000.

Arcamone, Federico: *See*—
Angelucci, Francesco; Penco, Sergio; and Arcamone, Federico, 4,600,537, Cl. 260-351.100.

Ares, Inc.: *See*—
Stoner, Eugene M., 4,599,933, Cl. 89-9.000.

Arita, Kazuhiro; Masuda, Isao; and Sano, Yasuo, to Takeda Chemical Industries, Ltd. Process for producing cross-linked resin from bis(2-oxazoline) and aromatic hydroxy-carboxylic acid. 4,600,766, Cl. 528-207.000.

Armco Inc.: *See*—
Kleimeyer, David L.; Fletcher, Larry N.; Stacy, Alan D.; and Smillie, Allan M., 4,600,434, Cl. 75-58.000.

Armerad Betong Vagforbattringar Aktiebolag: *See*—
Eriksson, Sture, 4,600,242, Cl. 299-7.000.

Armstrong Rubber Company: *See*—
Oswald, Richard W., 4,600,456, Cl. 156-117.000.

Armstrong, Stuart: *See*—
Short, Roger V.; and Armstrong, Stuart, 4,600,723, Cl. 514-416.000.

Artigue, Francis; Cormier, Roland; and Francois, Christian. Weighing apparatus with additional assembly for torsion compensation. 4,600,067, Cl. 177-211.000.

Asahi Glass Company Ltd.: *See*—
Washita, Hiroshi; and Oguro, Kaoru, 4,600,653, Cl. 428-425.600.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Aoki, Kunitoshi; and Nakamura, Shigeo, 4,600,541, Cl. 558-321.000.
Hirota, Takao; and Ishizaki, Yoichi, 4,600,154, Cl. 241-1.000.
Uchida, Seiichi, 4,600,667, Cl. 430-22.000.

Asahi Kasej Kogyo Kabushiki Kaisha: *See*—
Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, 4,600,749, Cl. 525-314.000.

Asahi Kogaku Kogyo K.K.: *See*—
Tokutomi, Seijiro; Shindo, Osamu; and Yuda, Hideaki, 4,600,830, Cl. 250-201.000.

Asai, Akio; Ando, Yukito; and Kirii, Kazunari, to Toyota Jidosha Kabushiki Kaisha. Apparatus for controlling dynamic characteristics of press load. 4,599,887, Cl. 72-453.130.

Ashai Optical Co., Ltd.: *See*—
Saito, Taizo, 4,600,278, Cl. 350-587.000.

Ashimori Industry Co., Ltd.: *See*—
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,600,615, Cl. 428-36.000.

Ashland Oil, Inc.: *See*—
Frank, Peter J.; and Hite, Jerry R., 4,600,795, Cl. 562-599.000.
Goel, Anil, 4,600,763, Cl. 528-111.000.
Goel, Anil B., 4,600,796, Cl. 564-159.000.
Hettinger, William P., Jr., 4,600,499, Cl. 208-113.000.

Ashworth, Steven W., to Delta International Machinery Corp. Tool fence. 4,600,184, Cl. 269-303.000.

AT&T Bell Laboratories: *See*—
Focht, Marlin W.; Koszi, Louis A.; and Schwartz, Bertram, 4,599,791, Cl. 29-576.00B.
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.

AT&T Information Systems: *See*—
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.

AT&T Information Systems Inc.: *See*—
Gerlits, Robert R., 4,600,812, Cl. 179-18.0AD.

AT&T Technologies, Inc.: *See*—
Blitchington, Frank H., 4,600,951, Cl. 358-280.000.

Grzeskowiak, John A., Jr.; and Hershkowitz, Elliott E., 4,600,522, Cl. 252-170.000.
Ling, Hung C.; and Yan, Man F., 4,600,967, Cl. 361-321.000.

AT&T Teletype Corporation: *See*—
Cardona, Ramon M.; and Wiater, Kenneth W., 4,600,929, Cl. 346-134.000.

Atkins, Donald G., to Marley-Wylain Company, The. Liquid level control apparatus. 4,600,844, Cl. 307-118.000.

Atkinson, Gerald O.: *See*—
Scales, Stanley R.; Shotwell, Duane E.; and Atkinson, Gerald O., 4,600,064, Cl. 175-368.000.

Atlantic Richfield Company: *See*—
Baillie, Lloyd A.; and Ryder, Amy L., 4,600,410, Cl. 55-1.000.

Atsuta, Toshio: *See*—
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,600,219, Cl. 285-55.000.

Audi AG.: *See*—
Naumann, Fritz; and Haldenwanger, Hans-Gunther, 4,600,217, Cl. 280-808.000.

Aufdermarsh, Carl A.; Harder, Robert J.; and Spiegelman, Phillip P., to Du Pont de Nemours, E. I., and Company. Fluoroelastomer laminates. 4,600,651, Cl. 428-422.000.

Automation Industries, Inc.: *See*—
Friedman, Gary, 4,599,900, Cl. 73-622.000.

Automotive Products plc: *See*—
Parsons, David, 4,599,860, Cl. 60-584.000.

Autopart Sweden Ab: *See*—
Jonsas, Mats, 4,600,234, Cl. 296-97.00K.

Avila, Ali R. Miniature fanciful simulated oil barrel containing crude oil and indicia means thereon useful as a novelty item. 4,600,102, Cl. 206-457.000.

Aycock, David F.; and Ting, Sai-Pei, to General Electric Company. Polyphenylene ether-polyamide blends. 4,600,741, Cl. 524-139.000.

Ayerst, McKenna & Harrison, Inc.: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,600,724, Cl. 514-510.000.

B.A.T. Cigaretten Fabriken GmbH: *See*—
Hass, Werner; and Heemann, Volker, 4,600,023, Cl. 131-275.000.

B. F. Goodrich Company, The: *See*—
Keefer, Ray A., 4,599,947, Cl. 105-15.000.

Baab, William E.: *See*—
Hummel, John E.; and Baab, William E., 4,600,163, Cl. 242-96.000.

Baba, Toru, to Kioritz Corporation. Cutter blade device of mowing machine. 4,599,796, Cl. 30-276.000.

Babcock & Wilcox Company, The: *See*—
Berthold, John W., III; Jeffers, Larry A.; and Thompson, Larry B., 4,600,836, Cl. 250-231.00P.

Bach, Joseph; and Boyer, Stephen K., to Ciba-Geigy Corporation. Process and intermediates for manufacture of 3-(5-amino-1-carboxypentylamino)-tetrahydro-1-benzazepin-2-one-1-acetic acid. 4,600,534, Cl. 260-239.30B.

Bacher, Michel: *See*—
Billet, Rene ; and Bacher, Michel, 4,600,092, Cl. 192-70.110.

Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., to Dayton Reliable Tool & Mfg. Co. Apparatus for transferring relatively flat objects. 4,599,884, Cl. 72-346.000.

Bachmann, Wolfgang; Spahn, Dieter; and Nuss, Lothar, to Roda Holding Anstalt. Method and arrangement for winding and forming helixes of elastic plastic or metal wire. 4,599,881, Cl. 72-128.000.

Backes, Thomas W.: *See*—
Dyroff, David R.; Burke, Edward J.; Vanderlinde, William; and Backes, Thomas W., 4,600,750, Cl. 525-398.000.

Bader, James S., to Adolph Coors Company. Molded clip reorienter and applicator. 4,599,848, Cl. 53-398.000.

Badger, Ronald L., to United Steel & Wire Company. Corner bumper for shopping cart. 4,600,204, Cl. 280-33.99A.

Bailey, Frank V.; Larsen, Robert T.; and VanRens, Russell J., to Outboard Marine Corporation. Molding apparatus and process including sand compaction system. 4,600,046, Cl. 164-34.000.

Baillie, Lloyd A.; and Ryder, Amy L., to Atlantic Richfield Company. Process and apparatus for separating particulate matter from a gaseous medium. 4,600,410, Cl. 55-1.000.

Baker, John W. Cranial perforator. 4,600,006, Cl. 128-310.000.

Baker, Nathaniel R.; and Lynch, Franklin E. Hydrogen sorbent flow aid composition and containment thereof. 4,600,525, Cl. 252-184.000.

Baker, Stanley Z. Vermin trap. 4,599,822, Cl. 43-114.000.

Baldwin, Willett F.; and Shen, Liang C., to Mobil Oil Corporation. Microwave electromagnetic borehole dipmeter. 4,600,887, Cl. 324-333.000.

Ball, Laurence G.: *See*—
Price, Macy J.; and Ball, Laurence G., 4,600,107, Cl. 211-41.000.

Ballenegger, Marc E.; and Zbinden, Paul, to Ciba-Geigy AG. Benzodioxole derivatives, processes for the manufacture thereof and corresponding pharmaceutical compositions. 4,600,709, Cl. 514-228.000.

Ban, Kaoru: *See*—
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, Fumikazu; and Ohguchi, Masakatsu, 4,600,743, Cl. 524-377.000.

Bangert, Matthew D.: *See*—
Fritzsche, Donald E.; Panora, Robert A.; and Bangert, Matthew D., 4,599,990, Cl. 126-351.000.

Bangerter, Blauer L.; and Streeter, James M., to Brigham Young University. Exercise machine for limb extremity digits. 4,600,188, Cl. 272-96.000.

Bangor Punta Corporation: *See*—
Fedora, Joseph; and Zajechowski, Fred, 4,599,818, Cl. 42-7.000.

Banker, John G.: *See*—
Sharp, William F.; Banker, John G.; and Hardwick, Roy, 4,600,332, Cl. 403-179.000.

Barabas, Eugene S., to Gaf Corporation. Process for making copolymers of vinylpyrrolidone and maleic anhydride. 4,600,759, Cl. 526-207.000.

Barber, Ronnie J.: *See*—
Roesel, John F., Jr.; and Barber, Ronnie J., 4,600,873, Cl. 318-701.000.

Barber, Steven C. Modular metal cabinet. 4,600,252, Cl. 312-263.000.

Barboza, Joseph V., to Texas Instruments Incorporated. Method and apparatus for storing electrical contact strips. 4,600,161, Cl. 242-55.000.

Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, to Barlian, Reinhold. Surveillance signal apparatus. 4,600,977, Cl. 362-362.000.

Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., to Conchemco, Incorporated. Electric restart control. 4,599,912, Cl. 74-501.00R.

Barnickel, Thomas J.: *See*—
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,599,891, Cl. 73-38.000.

Baron, Michael. Guard for gas cylinder valve. 4,600,033, Cl. 137-382.000.

Barouh, Victor; and Dinsky, Seth. Positioning system for molding plastic drive gear. 4,600,372, Cl. 425-128.000.

Barraud, Andre ; and Lelcuf, Jean, to Commissariat a l'Energie Atomique. Device for the formation and deposition on a substrate of monomolecular films. 4,599,969, Cl. 118-429.000.

Bartesch, Helmut; and Florin, Gerd, to Escher Wyss GmbH. Process for the conditioning of crushed oil-containing seeds prior to flaking. 4,600,594, Cl. 426-443.000.

Bartlett, Philip L., to Du Pont de Nemours, E. I., and Company. Aerosol corrosion inhibitors. 4,600,530, Cl. 252-392.000.

Barton, William J., to Kice Metal Products, Inc. Gas filtering apparatus. 4,600,415, Cl. 55-294.000.

Basalyk, Peter I.; Lukco, Dorothy; Mooney, J. Robert; and Seifert, Dexter C., to Kennecott Corporation. Process for removing surface oxides from a copper-base alloy. 4,600,443, Cl. 134-3.000.

BASF Aktiengesellschaft: *See*—
Bertleff, Werner; Muller, Franz-Josef; Kummer, Rudolf; and Harder, Wolfgang, 4,600,726, Cl. 518-701.000.
Broecker, Franz J.; Tavs, Peter; Laas, Harald; and Aders, Wolf-Karlo, 4,600,799, Cl. 568-772.000.

Bathelet, Pierre: *See*—
Lissalde, Francois; Bathelet, Pierre; Ferrieu, Bruno; and Brochier, Michel, 4,600,564, Cl. 422-249.000.

Battelle Memorial Institute: *See*—
Vermot-Gaud, Jacques; and Joyeux, Didier, 4,600,322, Cl. 400-124.000.

Bauer, John A., to RCA Corporation. Leadless chip carriers having self-aligning mounting pads. 4,600,970, Cl. 361-403.000.

Bauer, Norbert. Installation for recording and recovering binary signals on a magnetic information carrier. 4,600,954, Cl. 360-67.000.

Baugh, John L.: *See*—
Van Wormer, Richard A.; Baugh, John L.; Ledet, Charles; and Roach, Malcolm, 4,600,058, Cl. 166-382.000.

Baum, Allen; and Baum, Peter. Banked memory circuit. 4,601,018, Cl. 365-189.000.

Baum, Peter: *See*—
Baum, Allen; and Baum, Peter, 4,601,018, Cl. 365-189.000.

Baum, Peter N., to GTE Laboratories Incorporated. Predistortion equalizing circuit. 4,600,847, Cl. 307-491.000.

Baus, Heinz G. Frame, more particularly for a shower partition. 4,600,330, Cl. 403-23.000.

Bax, William P. Revolvable eating utensil and method of cleaning same. 4,599,797, Cl. 30-323.000.

Baxter Travenol Laboratories: *See*—
Kamen, Dean L., 4,600,401, Cl. 604-65.000.

Baxter Travenol Laboratories, Inc.: *See*—
Aid, James D., 4,600,512, Cl. 210-433.200.

Bayer Aktiengesellschaft: *See*—
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Freitag, Dieter; and Sayed, Aziz E., 4,600,764, Cl. 528-128.000.
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, 4,600,753, Cl. 525-439.000.
Hassel, Tillmann; and Muller, Hanns P., 4,600,771, Cl. 536-22.000.
Marhold, Albrecht; and Klauke, Erich, 4,600,787, Cl. 549-362.000.
Meisel, Karlheinrich; and Raue, Roderich, 4,600,776, Cl. 544-198.000.
Meyer, Rolf-Volker; Dhein, Rolf; Brassat, Bert; and Hagemann, Hermann, 4,600,752, Cl. 525-424.000.
Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, 4,600,632, Cl. 428-220.000.
Psaar, Hubertus, 4,600,930, Cl. 346-201.000.
Samaan, Samir; and Horstmann, Harald, 4,600,783, Cl. 548-501.000.
Schossler, Willi, 4,600,797, Cl. 564-414.000.
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, 4,600,778, Cl. 546-249.000.
von Bonin, Wulf; and Matenar, Gerd, 4,600,734, Cl. 523-179.000.
Zabrocki, Karl; Lindner, Christian; Muller, Friedmann; and Doring, Joachim, 4,600,747, Cl. 525-83.000.
Zecher, Wilfried; and Reinking, Klaus, 4,600,729, Cl. 521-128.000.

Bean, Jack. Bearing stop plate assembly for slot machine handle mechanism. 4,600,197, Cl. 273-143.00R.

Beard, Colin C.: *See*—
Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., 4,600,785, Cl. 549-212.000.

Beasley, Thomas R., to Dailey Petroleum Services Corp. Double-taper slip-on drill string stabilizer. 4,600,063, Cl. 175-325.000.

Beaumont, Gregory J., to Zenith Electronics Corporation. Cathode ray tube protection systems. 4,600,859, Cl. 315-3.000.

Beaumont, Richard W. Internal combustion hydraulic engine. 4,599,861, Cl. 60-595.000.

Beck, Bernard: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.

Becker, Claus: *See*—
Tendulkar, Gautan; Becker, Claus; and Richter, Wolfgang, 4,600,988, Cl. 364-200.000.

Beckwith, Elaine C.; and Ezis, Andre, to Ford Motor Company. Method of preparing powder ingredients by dry milling for subsequent consolidation. 4,600,547, Cl. 264-63.000.

Becton, Dickinson and Company: *See*—
Sage, Burton H., Jr., 4,600,302, Cl. 356-39.000.

Bedford Engineering Co.: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,600,141, Cl. 229-92.700.

Bednorz, Johannes G.; Lanz, Martin A.; Nievergelt, Hermann; and Pohl, Wolfgang D., to International Business Machines Corp. Piezoelectric stepping rotator. 4,600,854, Cl. 310-331.000.

Bedwell, Thomas J.; and Clarke, Earl J., to Wickes Manufacturing Company. Integral strut and piston groove protector. 4,599,936, Cl. 92-228.000.

Beecham Group P.L.C.: *See*—
Smith, Richard A. G., 4,600,580, Cl. 424-94.000.

Beer, Walter. Method and apparatus for testing ball striking rackets. 4,599,898, Cl. 73-579.000.

Behnke, Thomas L., to Lukens General Industries, Inc. Method of manufacturing an eccentric shaft. 4,599,922, Cl. 82-1.00C.

Beiersdorf AG: *See*—
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, to Alfred Teves GmbH. Hydraulic servo brake for motor vehicles. 4,600,243, Cl. 303-92.000.

Belisomi, Pietro; and Farina, Attilio, to Indesit Industria Elettrodomestici Italiana SpA. Equipment for reproduction of alphanumerical data. 4,600,918, Cl. 340-711.000.

Bell, Charles D.; and Smith, Pat, to Charles D. Bell Incorporated. Refracting instrument support arm. 4,600,175, Cl. 248-122.000.

Bell Telephone Laboratories, Inc.: *See*—
Ling, Hung C.; and Yan, Man F., 4,600,967, Cl. 361-321.000.

Bellini, Francesco: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,600,724, Cl. 514-510.000.

Belorussky Politekhnichesky Institut: *See*—
Stepanenko, Alexandr V.; Isaevich, Leonid A.; and Moisinovich, Ljudmila I., 4,599,880, Cl. 72-94.000.

Belvederi, Bruno: *See*—
Mattei, Riccardo; and Belvederi, Bruno, 4,600,020, Cl. 131-84.400.

Bendiberica S.A.: *See*—
Rosell, Jorge E., 4,599,911, Cl. 74-388.0PS.

Benefiel, Earl H.: *See*—
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,600,350, Cl. 414-267.000.

Benson, Harvey S.: *See*—
Wood, Charles D., III; and Benson, Harvey S., 4,600,052, Cl. 165-165.000.

Benson, Richard E.: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; and Benson, Richard E., 4,599,852, Cl. 56-15.800.

Benton, Max D.; and Robbins, William M., Jr. Extendible structures. 4,599,832, Cl. 52-118.000.

Bentz, Helmut, to O&K Orenstein & Koppel Aktiengesellschaft. Tread plate with grousers having curved regions. 4,600,246, Cl. 305-54.000.

Beraha, Dan. Transrectal prostate biopsy device and method. 4,600,014, Cl. 128-754.000.

Beretta, Germano, to Societa' Cavi Pirelli, S.p.A. Electric cable with covering preventing fire spreading. 4,600,806, Cl. 174-121.00A.

Berg, Robert F.: *See*—
Ihas, Gary G.; and Berg, Robert F., 4,600,802, Cl. 174-15.0CA.

Bergeron, Robert M. Turbocharger for two-cycle engines and method of operation thereof. 4,599,862, Cl. 60-605.000.

Bergthaller, Peter; Strauss, Jurgen; Runzheimer, Hans-Volker; and Wolfrum, Gerhard, to Agfa-Gevaert Aktiengesellschaft. Color photographic material with azo dicyanoimidazole dyes. 4,600,681, Cl. 430-242.000.

Berlemont, Jacques, to Etablissements Boulenger. Elastic floor covering and process for making same. 4,600,639, Cl. 428-327.000.

Bernasconi, Raymond: *See*—
Schenker, Karl; and Bernasconi, Raymond, 4,600,719, Cl. 514-320.000.

Bernhard Forster GmbH: *See*—
Forster, Rolf, 4,600,382, Cl. 433-5.000.

Berokoff, Andrew J. Exercising device. 4,600,190, Cl. 272-136.000.

Berthold, John W., III; Jeffers, Larry A.; and Thompson, Larry B., to Babcock & Wilcox Company, The. Diaphragm deflection sensor for fused silica diaphragm module. 4,600,836, Cl. 250-231.00P.

Bertleff, Werner; Muller, Franz-Josef; Kummer, Rudolf; and Harder, Wolfgang, to BASF Aktiengesellschaft. Preparation of ethylene glycol. 4,600,726, Cl. 518-701.000.

Besson, Rene , to ETA SA Fabriques d'Ebauches. Watch having an analog and digital display. 4,600,316, Cl. 368-187.000.

Betz, Dieter, to Robert Bosch GmbH. Ignition coil for multi-cylinder internal combustion engine. 4,599,985, Cl. 123-622.000.

Beugelsdyk, Anthony F.: *See*—
Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., 4,599,912, Cl. 74-501.00R.

Bianco, Carlo, to Strada Cantonale. Selectively controlled dual delivery pump, particularly for motor vehicle application. 4,600,361, Cl. 415-146.000.

Bietry, Joseph R., to Eastman Kodak Company. Optical disc player lens. 4,600,276, Cl. 350-432.000.

Billet, Rene ; and Bacher, Michel, to Valeo. Clutch cover and flywheel securement assembly. 4,600,092, Cl. 192-70.110.

Bimba, Charles W. Connection system for flexible tubing. 4,600,221, Cl. 285-91.000.

Bingham, John: *See*—
Scarr, Robert W. A.; and Bingham, John, 4,601,027, Cl. 370-3.000.

Biolectron, Inc.: *See*—
Dugot, Richard S., 4,600,010, Cl. 128-419.00F.

Biomechanical Engineering Corporation: *See*—
Boyd, Timothy L.; and Bizzoco, Dennis L., 4,600,016, Cl. 128-782.000.

Biondi, Carlo: *See*—
Frascaroli, Francesco; and Biondi, Carlo, 4,600,173, Cl. 248-68.100.

Bischofberger, Otfried: *See*—
Pammer, Erich; and Bischofberger, Otfried, 4,600,600, Cl. 427-89.000.

Bishop, Martin T., to Westinghouse Electric Corp. Protective relay apparatus for detecting high-impedance ground faults. 4,600,961, Cl. 361-76.000.

Bizzoco, Dennis L.: *See*—
Boyd, Timothy L.; and Bizzoco, Dennis L., 4,600,016, Cl. 128-782.000.

Blackburn, Wayne: *See*—
Liston, Max D.; Braig, James R.; Blackburn, Wayne; and Hsei, Paul, 4,600,412, Cl. 55-189.000.

Blain, Edward S., to Sundstrand Corporation. Positive displacement scroll type apparatus with fluid pressure biasing the scroll. 4,600,369, Cl. 418-55.000.

Blair, Dennis P.: *See*—
Roof, William M.; and Blair, Dennis P., 4,600,131, Cl. 222-478.000.

Blanchard, Russell O., to John Thomas Batts, Inc. Adjustable hanger. 4,600,132, Cl. 223-95.000.

Bland, Alfred J.: *See*—
Stewart, Denzil S.; Bland, Alfred J.; and Rogers, Donald D., 4,600,205, Cl. 280-95.00R.

Bland, Timothy J.: *See*—
Sutrina, Thomas A.; and Bland, Timothy J., 4,600,848, Cl. 310-54.000.

Blazejovsky, Walter. Electrically heated diesel engine fuel conveying system. 4,600,825, Cl. 219-205.000.

Bliehall, James C., to Sentec Inc. Apparatus for monitoring and protecting a device against a plurality of fault conditions. 4,600,962, Cl. 361-77.000.

Blight, Ronald E., to Raytheon Company. Magnetically tuned resonant circuit wherein magnetic field is provided by a biased conductor on the circuit support structure. 4,600,906, Cl. 333-205.000.

Blitchington, Frank H., to AT&T Technologies, Inc. Scanning sample, signal generation, data digitizing and retiming system. 4,600,951, Cl. 358-280.000.

Block, Barry: *See*—
Aine, Harry E.; and Block, Barry, 4,600,934, Cl. 357-26.000.

Bloomstein, Richard W. Altering facial displays in cinematic works. 4,600,281, Cl. 352-50.000.

Blose, Thomas L., to Interlock Technologies Corporation. Tubular connection having a chevron wedge thread. 4,600,224, Cl. 285-334.000.

Blose, Thomas L., to Interlock Technologies Corporation. Tubular connection having a parallel chevron thread. 4,600,225, Cl. 285-334.000.

Bo, Ermano, to Societe B.B.M. S.A. Cold marking typesetting stick cartridge stamping tool. 4,599,942, Cl. 101-18.000.

Board, Harry B. Pocket reducing insert for toolholder and the like. 4,600,341, Cl. 407-99.000.

Board of Trustees University of Arkansas: *See*—
Nelson, Glenn S., 4,600,351, Cl. 414-331.000.

Bock, Erich: *See*—
Kastenhuber, Manfred; Eckel, Alfred; and Bock, Erich, 4,600,167, Cl. 244-3.280.

Boeckmann, Eduard F. B., to GTE Communication Systems Corp. Integrated bootstrap bias circuit. 4,600,876, Cl. 323-311.000.

Boeing Company, The: *See*—
Chee, Wan T.; and Quigley, George W., 4,600,619, Cl. 428-118.000.

Bofginer, Gerd: *See*—
Stelter, Norbert; Wuest, Rainer; op de Beeck, Peter; and Bofginer, Gerd, 4,599,918, Cl. 74-866.000.

Bok, Edward, to Integrated Automation, Limited. Method and apparatus for transport and processing of substrate with developing agent. 4,600,471, Cl. 156-646.000.

Bolens Corporation: *See*—
Thurner, Gary H., 4,600,070, Cl. 180-53.700.

Bolger, Thomas V., to RCA Corporation. Digital video processing system with raster distortion correction. 4,600,945, Cl. 358-160.000.
Bonebright, Cynthia A.: *See—*
Hardt, Ivan E.; Bonebright, Cynthia A.; and Fuller, Ray C., 4,601,043, Cl. 375-1.000.
Borbe, Harald O.: *See—*
Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, 4,600,722, Cl. 514-367.000.
Borchardt, John K., to Halliburton Company. Method of reducing the permeability of a subterranean formation. 4,600,057, Cl. 166-295.000.
Borg-Warner Chemicals, Inc.: *See—*
Carr, Lawrence J.; and Nichols, George M., 4,600,791, Cl. 558-80.000.
Boro Recycling, Inc.: *See—*
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.
Bos, Pierre H.; Musseau, Joel R.; and Richard, Jean-Pierre, to Dito Sama. Machine for processing foodstuffs and other products, particularly for chopping and mixing the same. 4,600,155, Cl. 241-37.500.
Boschung, Marcel; and Schmutz, Beat, to Boschung Mecatronic AG. Snowfall measuring method and apparatus. 4,600,842, Cl. 250-577.000.
Boschung Mecatronic AG: *See—*
Boschung, Marcel; and Schmutz, Beat, 4,600,842, Cl. 250-577.000.
Bottenbruch, Ludwig: *See—*
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Freitag, Dieter; and Sayed, Aziz E., 4,600,764, Cl. 528-128.000.
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, 4,600,753, Cl. 525-439.000.
Bouchard, Andre C.; Thibault, Paul A.; and Marcucci, Rudolph V., to GTE Products Corporation. Compact low pressure arc discharge lamp. 4,600,856, Cl. 313-25.000.
Boudreau, Daniel A.; and Salas, Edward R., to Honeywell Information Systems Inc. Priority resolver with lowest priority level having shortest logic path. 4,600,992, Cl. 364-200.000.
Bourns Instruments, Inc.: *See—*
Marks, Eugene A.; and Peters, Arthur J., 4,600,912, Cl. 338-42.000.
Boussac Saint-Freres B.S.F.: *See—*
Rousseau, Jean L., 4,599,811, Cl. 36-105.000.
Bouwhuis, Harry E., to Bouwhuis Protective Undergarment Ltd. Protective undergarment. 4,599,751, Cl. 2-400.000.
Bouwhuis Protective Undergarment Ltd.: *See—*
Bouwhuis, Harry E., 4,599,751, Cl. 2-400.000.
Bowman, Bonita F., to Mobil Oil Corporation. Automatic gain control in seismic data samples. 4,601,023, Cl. 367-65.000.
Boyd, Timothy L.; and Bizzoco, Dennis L., to Biomechanical Engineering Corporation. Method and apparatus for gait recording and analysis. 4,600,016, Cl. 128-782.000.
Boydston, Robert W. Mini-tonneau cover apparatus for rear compartment of convertible vehicle. 4,600,233, Cl. 296-24.00R.
Boyer, Claude; Gauthier, Francois H.; and Gerbe, Jean-Pierre, to Thomson CSF. Head-up display. 4,600,271, Cl. 350-174.000.
Boyer, Stephen K.: *See—*
Bach, Joseph; and Boyer, Stephen K., 4,600,534, Cl. 260-239.30B.
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, to Commissariat a l'Energie Atomique; and Novatome. Secondary heat transfer circuit for a nuclear reactor cooled by a liquid metal such as sodium, as well as a steam generator particularly suitable for such a circuit. 4,600,554, Cl. 376-307.000.
Bradley, Jerome R., to Ex-Cell-O Corporation. Fuel injector assembly with water or auxiliary fuel capability. 4,600,151, Cl. 239-400.000.
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., to Bedford Engineering Co. Mailing envelope and insert subassembly. 4,600,141, Cl. 229-92.700.
Braestrup, Claus T.: *See—*
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.
Braig, James R.: *See—*
Liston, Max D.; Braig, James R.; Blackburn, Wayne; and Hsei, Paul, 4,600,412, Cl. 55-189.000.
Brass, Stephen G.: *See—*
Jessup, Peter J.; Brass, Stephen G.; and Croudace, Michael C., 4,600,408, Cl. 44-70.000.
Brassat, Bert: *See—*
Meyer, Rolf-Volker; Dhein, Rolf; Brassat, Bert; and Hagemann, Hermann, 4,600,752, Cl. 525-424.000.
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., to Temco, Inc. TCH—tri-axial core holder. 4,599,891, Cl. 73-38.000.
Braun, Hilarion; and Piatt, Michael J., to Eastman Kodak Company. Ink jet printing apparatus having ultrasonic print head cleaning system. 4,600,928, Cl. 346-1.100.
Braunschweig, Thomas: *See—*
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.
Breckenfeld, Paul W.; Broughton, George L.; Calamia, David C.; and Macier, James E., to Outboard Marine Corporation. Upper crankshaft bearing lubrication system for two-cycle engine. 4,599,979, Cl. 123-73.0AD.
Brems, John H.; and Mason, Arthur C., to Lamb Technicon Corp. Mechanical welding press. 4,600,095, Cl. 198-346.200.
Brettle, Jack: *See—*
Lodge, Kevin J.; and Brettle, Jack, 4,600,642, Cl. 428-367.000.
Bridger, Robert F., to Mobil Oil Corporation. Method of preparing organic ammonium dialkyl phosphorodithioates. 4,600,543, Cl. 558-133.000.
Bridges, Jack E.; Sutkowski, Robert J.; and Hofer, Kenneth E., Jr., to Gas Research Institute. Underground pipeline and cable detector and process. 4,600,356, Cl. 414-694.000.
Bridgestone Corporation: *See—*
Kaneko, Shigeru; Hirata, Yoshiaki; and Nohara, Yoshio, 4,600,370, Cl. 425-38.000.
Bridgstone Corporation: *See—*
Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, 4,600,627, Cl. 428-203.000.
Briggs, Paul C.: *See—*
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,600,662, Cl. 428-624.000.
Brigham Young University: *See—*
Bangerter, Blauer L.; and Streeter, James M., 4,600,188, Cl. 272-96.000.
Briscoe, Robert J. Converter device for a computer terminal. 4,601,010, Cl. 364-900.000.
Bristol-Myers Company: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,600,779, Cl. 548-135.000.
Pircio, Anthony W.; Buyniski, Joseph P.; and Comer, William T., 4,600,578, Cl. 424-78.000.
British Petroleum Company p.l.c., The: *See—*
McCarroll, John J.; Tennison, Stephen R.; and Wilkinson, Nicholas P., 4,600,571, Cl. 423-363.000.
British Steel Corporation: *See—*
Reynold, Timothy; Montgomery, Robert W.; Swaby, Harold; and Garner, Henry C., 4,601,042, Cl. 373-93.000.
British Telecommunications: *See—*
Pilling, Gerald A., 4,600,813, Cl. 179-18.0FC.
Britt Corporation: *See—*
McDonald, John J., 4,601,037, Cl. 372-25.000.
Britton, Charles: *See—*
Trenkler, George; Delagi, Richard; Britton, Charles; and Schwensfeir, Robert J., Jr., 4,599,771, Cl. 29-155.00R.
Brochier, Michel: *See—*
Lissalde, Francois; Bathelet, Pierre; Ferrieu, Bruno; and Brochier, Michel, 4,600,564, Cl. 422-249.000.
Broding, Robert A., to Amoco Corporation. Borehole televiewer system using multiple transducer subsystems. 4,601,024, Cl. 367-86.000.
Broecker, Franz J.; Tavs, Peter; Laas, Harald; and Aders, Wolf-Karlo, to BASF Aktiengesellschaft. Preparation of trimethylhydroquinone. 4,600,799, Cl. 568-772.000.
Brois, Stanley J.: *See—*
Gutierrez, Antonio; O'Halloran, Rosemary; and Brois, Stanley J., 4,600,519, Cl. 252-48.600.
Bromberg, Edward E. A.; Diggens, Albert; West, Steven J.; and Ross, James W., to Orion Research, Inc. Ion analyzer calibration cell. 4,600,494, Cl. 204-401.000.
Bromley, James E.; Chamberlin, John M.; and Yu, Jing-peir, to Monsanto Company. Polyester yarn, self-texturing in fabric form. 4,600,644, Cl. 428-399.000.
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., to Illinois Tool Works Inc. Ferrous article layered with ion vapor deposited non-oxidized aluminum. 4,600,662, Cl. 428-624.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Okamoto, Tsugio; and Maeda, Junichi, 4,600,325, Cl. 400-208.000.
Broughton, George L.: *See—*
Breckenfeld, Paul W.; Broughton, George L.; Calamia, David C.; and Macier, James E., 4,599,979, Cl. 123-73.0AD.
Brower, Boyd G., to GTE Products Corporation. Rapid-start fluorescent lamp closure switch. 4,600,860, Cl. 315-73.000.
Brown, Eric D., to Sodastream Limited. Manufacture of metal containers. 4,599,886, Cl. 72-349.000.
Brown, Mary F. Toddler cup. 4,600,111, Cl. 215-6.000.
Brown, Omar L.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,599,884, Cl. 72-346.000.
Browne, Alan R.; and Morgan, Charles R., to W. R. Grace & Co. Water-developable, negative-working, diazo lithographic printing plate with oleophilic ester overlayer. 4,600,679, Cl. 430-162.000.
Bruder, John R.; Sivulka, Gerald M.; and Tribe, Leonard T., to Kelsey-Hayes Company. Electrical cut off float switch. 4,600,820, Cl. 200-84.00C.
Brudi Equipment, Inc.: *See—*
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,600,350, Cl. 414-267.000.
Brudi, Ronald A.: *See—*
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,600,350, Cl. 414-267.000.
Brugger, Werner, to Gebruder Buhler AG. Machine for molding articles by injection molding or die casting. 4,600,374, Cl. 425-149.000.
Brune, Kay: *See—*
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.
Brunner, Reinhold: *See—*
Schonberger, Franz; Stadlmeier, Hans; Brunner, Reinhold; and Wagner, Wolfgang, 4,600,991, Cl. 364-200.000.
Bruno, John D.: *See—*
Wiegers, Ben W.; Chou, Eddie C. J.; Bruno, John D.; and Leaver, Helen S., 4,600,435, Cl. 75-119.000.

Brunswick Corporation: *See*—
Crane, Paul W.; and Kusche, David W., 4,600,396, Cl. 440-77.000.
Brusasca, Gianfranco; and Garzulano, Franco, to Rockwell-Rimoldi S.p.A. Sewing machine thread chain cutter. 4,599,960, Cl. 112-287.000.
Brusasca, Gianfranco; and Garzulano, Franco, to Rockwell-Rimoldi S.p.A. Sewing machine thread chain cutter. 4,599,961, Cl. 112-287.000.
Bryant, Lawrence M. Open loop acceleration/deceleration control for disk drive stepper motors. 4,600,868, Cl. 318-567.000.
Bucher, Heinz, to Metronic Electronic GmbH. Massage apparatus with a disengageable vibratory massage plate. 4,599,997, Cl. 128-36.000.
Buckhorn Material Handling Group, Inc.: *See*—
Tabler, Charles P., 4,600,103, Cl. 206-505.000.
Bullock, Robert E., to Chamberlain Manufacturing Corporation. Insert retainer for storm door. 4,599,833, Cl. 52-127.500.
Bunger, Paul: *See*—
Thoma, Martin; and Bunger, Paul, 4,600,479, Cl. 204-14.100.
Burgdorf, Jochen: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,600,243, Cl. 303-92.000.
Burke, Edward J.: *See*—
Dyroff, David R.; Burke, Edward J.; Vanderlinde, William; and Backes, Thomas W., 4,600,750, Cl. 525-398.000.
Burkholder, Amy L.: *See*—
Adair, Paul C.; and Burkholder, Amy L., 4,600,678, Cl. 430-138.000.
Burkholder, Dennis L., to Shuttleworth, John. Vehicle steering and suspension system. 4,600,216, Cl. 280-772.000.
Burrows, James L., to Sanders Associates, Inc. Universal logic circuit modules. 4,600,846, Cl. 307-465.000.
Burt, Dan L.: *See*—
Anderson, George F.; and Burt, Dan L., 4,600,658, Cl. 428-450.000.
Burton, Guy C., Jr., to Burton, Rejane M., a part interest. Method and apparatus for completing well. 4,600,056, Cl. 166-291.000.
Burton, Rejane M.: *See*—
Burton, Guy C., Jr., 4,600,056, Cl. 166-291.000.
Buscher, Josef, to Ford Motor Company. Method for manufacturing synchronizer clutch teeth. 4,599,775, Cl. 29-159.200.
Butler, Jay W.: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., 4,600,451, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,452, Cl. 149-19.300.
Butler, Kevin D.; and Henderson, Harry E., to Exxon Research and Engineering Co. Adsorbent processing to reduce basestock foaming. 4,600,502, Cl. 208-284.000.
Butwell, Anthony J., to Water Research Centre. Liquid treatment apparatus. 4,600,510, Cl. 210-273.000.
Buyniski, Joseph P.: *See*—
Pircio, Anthony W.; Buyniski, Joseph P.; and Comer, William T., 4,600,578, Cl. 424-78.000.
Byrd, James D.: *See*—
Junior, Kenneth E.; Byrd, James D.; and Hightower, James O., Jr., 4,600,732, Cl. 523-138.000.
Byrne, Allan B.: *See*—
Koster, William G.; and Byrne, Allan B., 4,600,169, Cl. 244-118.100.
C.O.M. Cooperativa Operai Metallurgici S.C.R.L.: *See*—
Frascaroli, Francesco; and Biondi, Carlo, 4,600,173, Cl. 248-68.100.
"Cablerie d'Eupen", Aktiengesellschaft: *See*—
Ludwigs, Hermann, 4,600,176, Cl. 254-134.3FT.
Cade, Paul E.; El-Kareh, Badih; and Kim, Ick W., to International Business Machines Corporation. Buried field shield for an integrated circuit. 4,599,792, Cl. 29-576.00W.
Caggiano, Michael A.: *See*—
Virk, Kashmir S.; Caggiano, Michael A.; and Leisenring, Roger L., Jr., 4,600,562, Cl. 422-180.000.
Cain, Gary L.; Honey, Elvin K.; and Goren, Sidney B., to Spectra-Physics, Inc. Surveying system. 4,600,997, Cl. 364-505.000.
Caine, Harold A. Collision avoidance device. 4,600,913, Cl. 340-104.000.
Cal-Flo Corporation: *See*—
Swisher, Horton E., 4,600,593, Cl. 426-438.000.
Calamia, David C.: *See*—
Breckenfeld, Paul W.; Broughton, George L.; Calamia, David C.; and Macier, James E., 4,599,979, Cl. 123-73.0AD.
Calder, Alan R.: *See*—
Malpas, Jon H.; and Calder, Alan R., 4,600,127, Cl. 222-83.000.
Calhoun, Wiley C.: *See*—
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.
Califano, Herbert T.; Schuchardt, James M.; and Spindler, Gotthard K., to Allied Corporation. Missile having reduced mass guidance system. 4,600,166, Cl. 244-3.160.
Callahan, Michael. Color changer mechanism. 4,600,976, Cl. 362-277.000.
Calton, Gary J.: *See*—
Wood, Louis L.; and Calton, Gary J., 4,600,692, Cl. 435-108.000.
Cambridge Filter Corporation: *See*—
Mattison, Allen H., 4,600,419, Cl. 55-484.000.
Camco, Incorporated: *See*—
Durst, Douglas G.; and Morris, Arthur J., 4,600,055, Cl. 166-115.000.
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, to KenoGard AB. Guanidated aminophosphonic acid compounds. 4,600,429, Cl. 71-86.000.
Campbell, Curtis B., to Chevron Research Company. Quaternary deposit control additives. 4,600,409, Cl. 44-71.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Poirier, Marc-Andre, 4,600,501, Cl. 208-188.000.
Canon Kabushiki Kaisha: *See*—
Fujiyama, Yasutomo; and Okabe, Shotaro, 4,599,971, Cl. 118-723.000.
Fushimoto, Hideo, 4,600,257, Cl. 339-40.000.
Iizuka, Kazuo, 4,600,275, Cl. 350-418.000.
Kohayakawa, Yoshimi; and Matsushita, Machiko, 4,600,012, Cl. 128-665.000.
Kondoh, Yuji; and Fukushima, Tadahide, 4,600,284, Cl. 354-82.000.
Makita, Masaru, 4,600,920, Cl. 340-735.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,600,671, Cl. 430-57.000.
Seto, Kaoru, 4,600,866, Cl. 318-313.000.
Sugitani, Hiroshi, 4,600,927, Cl. 346-1.100.
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.
Suzuki, Koji, 4,600,295, Cl. 355-14.00D.
Suzuki, Ryoichi, 4,600,288, Cl. 354-435.000.
Terasawa, Koji, 4,600,931, Cl. 346-140.00R.
Yamamura, Mitsugu; and Yomoda, Minoru, 4,600,282, Cl. 353-122.000.
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., to Anamet, Inc. Method of assembling flexible conduit and fitting. 4,599,784, Cl. 29-450.000.
Caputo, Nick: *See*—
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.
Caputo, William R., to Westinghouse Electric Corp. Transportation apparatus. 4,600,865, Cl. 318-274.000.
Cardona, Ramon M.; and Wiater, Kenneth W., to AT&T Teletype Corporation. Apparatus for handling paper in a printer. 4,600,929, Cl. 346-134.000.
Carl Freudenberg, Firma: *See*—
Horn, Falk R.; Schmitt, Roland; Gurr, Manfred; and Grimm, Rolf, 4,600,623, Cl. 428-151.000.
Carlson, James D.; and Colucci, Stephen L., to National-Standard Company. Screen for separating and classifying particulate material and method of making same. 4,600,622, Cl. 428-135.000.
Carlson, Leroy H., Jr.; and Kesten, Martin, to Preston Engravers, Inc. Rotary cutting dies with vacuum assist to cut and clear waste. 4,599,926, Cl. 83-100.000.
Carlson, Timothy L.: *See*—
Ward, John W.; and Carlson, Timothy L., 4,600,497, Cl. 208-89.000.
Carmena, Angel D.: *See*—
Santurtun, Carlos M.; and Carmena, Angel D., 4,601,051, Cl. 378-118.000.
Carney, Scott N.; and Linder, Donald L., to Motorola Inc. Automatic frequency control circuit having an equalized closed loop frequency response. 4,601,061, Cl. 455-208.000.
Carr, Lawrence J.; and Nichols, George M., to Borg-Warner Chemicals, Inc. Process for preparation of phosphazene esters. 4,600,791, Cl. 558-80.000.
Carrasquel, Angel R.: *See*—
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., 4,600,703, Cl. 502-210.000.
Carter, A. F. Anti-fungal feed compositions containing natamycin. 4,600,706, Cl. 514-31.000.
Casio Computer Co., Ltd.: *See*—
Takahashi, Naoki, 4,599,930, Cl. 84-1.100.
Castel, Yvon, to Societe Nationale Elf Aquitaine (Production). Shield for protecting a well head and functional modules of an under sea station. 4,600,339, Cl. 405-211.000.
Castello, Jose M.: *See*—
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.
Castillo, James D. Adjustable polycentric orthopedic appliance hinge. 4,599,998, Cl. 128-77.000.
Catalytica Associates: *See*—
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,600,793, Cl. 560-25.000.
Caterpillar Tractor Co.: *See*—
Jero, John P.; Loda, Michael A.; and Slusarek, William L., 4,599,899, Cl. 73-584.000.
Caudill, Keith E.: *See*—
Vogel, Ralph A.; and Caudill, Keith E., 4,599,905, Cl. 73-830.000.
CAVRI Systems, Inc.: *See*—
Schwartz, Marc D.; and Sura, Christopher B., 4,600,989, Cl. 364-200.000.

Cebe, Jerry F.: *See*—
Horton, James P.; Cebe, Jerry F.; Hagemes, Dave; and Jeter, Lewis M., 4,599,991, Cl. 126-345.000.

Ceccacci, Pier B., to Tubi Italia S.p.A. Process for the construction of a composite tube comprising a metal tube, in particular a copper tube, and a cladding of deformable foam material. 4,599,783, Cl. 29-450.000.

Cedarapids, Inc.: *See*—
Musil, Joseph E., 4,600,377, Cl. 431-351.000.

Ceeco Machinery Manufacturing Limited: *See*—
Varga-Papp, Andre, 4,599,853, Cl. 57-9.000.

Cella, James A., to General Electric Company. Aryl-diethers. 4,600,798, Cl. 568-636.000.

Cellerino, Giuliano, to GTE Communication Systems Corporation. Circuit for limiting jitter transients during switching of phase control signals to an oscillator. 4,600,896, Cl. 331-11.000.

Centre National de la Recherche Schientifique (C N R S): *See*—
Gallot, Bernard; and Douy, Andre , 4,600,526, Cl. 252-299.010.

Chadwick, John C.; and Goodall, Brian L., to Shell Oil Company. Process for the preparation of polyisoprene. 4,600,757, Cl. 526-142.000.

Chafin, Andrew P.; and Nielsen, Arnold T., to United States of America, Navy. Explosive compound. 4,600,536, Cl. 260-349.000.

Chaiet, Louis; Monaghan, Richard L.; Zimmerman, Sheldon B.; and Fernandez, Maria I. M., to Merck & Co., Inc. R-(Z)-4-amino-3-chloro-2-pentenedioic acid, novel antibacterial agent. 4,600,691, Cl. 435-106.000.

Chamberlain Manufacturing Corporation: *See*—
Bullock, Robert E., 4,599,833, Cl. 52-127.500.

Chamberlain, William; and Weigand, John C., to Zenith Electronics Corporation. Television sound mute circuit. 4,600,947, Cl. 358-165.000.

Chamberlin, John M.: *See*—
Bromley, James E.; Chamberlin, John M.; and Yu, Jing-peir, 4,600,644, Cl. 428-399.000.

Chaplin, George B. B.; and Smith, Roderick A., to Sound Attenuators Limited. Method of and apparatus for active vibration isolation. 4,600,863, Cl. 318-114.000.

Chapman, Vernon R. Log splitting apparatus. 4,600,043, Cl. 144-193.00A.

Charles D. Bell Incorporated: *See*—
Bell, Charles D.; and Smith, Pat, 4,600,175, Cl. 248-122.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
McKenna, John F., Jr., 4,600,845, Cl. 307-269.000.

Chatzipetros, Johann: *See*—
Wyrwich, Helmut; Graschew, Georgi; Chatzipetros, Johann; and Feinendegen, Ludwig E., 4,599,800, Cl. 33-143.00C.

Chee, Wan T.; and Quigley, George W., to Boeing Company, The. Continuously wound filament structure for use in noise attenuation element. 4,600,619, Cl. 428-118.000.

Chem-Technics, Inc.: *See*—
Conner, Jesse R., 4,600,514, Cl. 210-751.000.

Cheng, Paul J.; and Elkins, Tammy M., to Phillips Petroleum Company. Pitch conversion. 4,600,496, Cl. 208-44.000.

Cheron, Jacques: *See*—
Gosse, Marc; and Cheron, Jacques, 4,600,174, Cl. 248-72.000.

Chevron Research Company: *See*—
Campbell, Curtis B., 4,600,409, Cl. 44-71.000.
Hubred, Gale L.; and Dubrovsky, Michael, 4,600,483, Cl. 204-130.000.
Muir, Francis, 4,601,022, Cl. 367-14.000.

Chiba, Seibi: *See*—
Watari, Masao; and Chiba, Seibi, 4,601,054, Cl. 382-1.000.

Childs, Margaret; and Costikyan, Kathryn R., to Designs for Comfort, Inc. Cap for women to conceal hair loss. 4,599,749, Cl. 2-199.000.

Chiyoda Chemical Engineering & Con. Co., Ltd.: *See*—
Yamamoto, Shizuo; Kanda, Tetsuo; Suzuki, Nobuaki; and Matsuda, Hiroyuki, 4,600,076, Cl. 181-233.000.

Chou, Eddie C. J.: *See*—
Wiegers, Ben W.; Chou, Eddie C. J.; Bruno, John D.; and Leaver, Helen S., 4,600,435, Cl. 75-119.000.

Christen, Chris R.; and Cianfarani, Frank M. Lock with anchor mount. 4,600,226, Cl. 292-264.000.

Christensen, Burton G.; and Shih, David H., to Merck & Co., Inc. 1-, 6- and 2-substituted-1-carba-2-penem-3-carboxylic acids. 4,600,713, Cl. 514-210.000.

Chu, George, to Collagen Corporation. Collagen membranes for medical use. 4,600,533, Cl. 530-356.000.

CHUR-IAN, Ltd.: *See*—
Church, George R.; and Kocian, Roger J., 4,599,923, Cl. 82-36.00R.

Church, George R.; and Kocian, Roger J., to CHUR-IAN, Ltd. Tool bit and holder assembly. 4,599,923, Cl. 82-36.00R.

Chutjian, Ara N., to United States of America, Administrator, National Aeronautics and Space Administration. Double photon excitation of high-rydberg atoms as a long-lived submillimeter detector. 4,600,840, Cl. 250-338.000.

Cianfarani, Frank M.: *See*—
Christen, Chris R.; and Cianfarani, Frank M., 4,600,226, Cl. 292-264.000.

Ciba-Geigy AG: *See*—
Ballenegger, Marc E.; and Zbinden, Paul, 4,600,709, Cl. 514-228.000.

Ciba-Geigy Corporation: *See*—
Bach, Joseph; and Boyer, Stephen K., 4,600,534, Cl. 260-239.30B.
Schenker, Karl; and Bernasconi, Raymond, 4,600,719, Cl. 514-320.000.
Szczepanski, Henry, 4,600,428, Cl. 71-76.000.

CIDELCEM: *See*—
Tzifkansky, Guy; and Marchais, Jean-Claude, 4,600,117, Cl. 220-366.000.

Cincinnati Milacron Inc.: *See*—
Uhtenwoldt, Herbert R., 4,599,786, Cl. 29-568.000.

Circon Corporation: *See*—
Sluyter, Erik; and Wooff, Edward A., Jr., 4,600,938, Cl. 358-98.000.
Sluyter, Erik; and Wooff, Edward A., Jr., 4,600,939, Cl. 358-98.000.
Sluyter, Erik, 4,600,940, Cl. 358-98.000.

Cirrus Computers Ltd.: *See*—
Robinson, Gordon D., 4,601,032, Cl. 371-23.000.

Claas Ohg: *See*—
Clostermeyer, Gerhard; and Muller, Werner, 4,599,844, Cl. 53-118.000.

Clark, James W., to Fairchild Semiconductor Corporation. Film carrier for manufacturing semiconductor devices. 4,600,611, Cl. 428-13.000.

Clark, Lloyd D. Digital audio recording/playback system for motion picture film. 4,600,280, Cl. 352-37.000.

Clark, Marshall L.: *See*—
Cummings, Ralph L.; and Clark, Marshall L., 4,600,695, Cl. 436-2.000.

Clark, O. Melville, to General Semiconductor Industries, Inc. Four terminal pulse suppressor. 4,600,960, Cl. 361-56.000.

Clark, Russell L.: *See*—
Suman, Michael J.; Van Order, Kim L.; Clark, Russell L.; and Haan, Ted W., 4,600,240, Cl. 297-408.000.

Clarke, Earl J.: *See*—
Bedwell, Thomas J.; and Clarke, Earl J., 4,599,936, Cl. 92-228.000.

Clayatt, Clarence L., III: *See*—
DeChamp, David W.; and Clayatt, Clarence L., III, 4,600,263, Cl. 339-177.00R.

Clements, Brenda. Mascara applicator. 4,600,328, Cl. 401-129.000.

Clevepak Corporation: *See*—
Nestich, R. Frank, 4,600,031, Cl. 137-218.000.

Clextral: *See*—
Mourrier, Francis; and Pelissier, Felix, 4,600,311, Cl. 366-88.000.

Cloren, Peter. Coextrusion process for overcoming the curtaining effect. 4,600,550, Cl. 264-171.000.

Clostermeyer, Gerhard; and Muller, Werner, to Claas Ohg. Large baling press for agricultural products. 4,599,844, Cl. 53-118.000.

Clyatt, Clarence L., III: *See*—
Nieman, Gerald R.; Thompson, James E.; Couper, William D.; and Clyatt, Clarence L., III, 4,600,262, Cl. 339-147.00R.

Clyde, Robert A. Apparatus for harvesting cells. 4,600,694, Cl. 435-312.000.

Cobb, Lloyd A.: *See*—
Glynn, John R.; and Cobb, Lloyd A., 4,600,805, Cl. 174-102.00R.

Cochran, Bruce C.: *See*—
Fusco, Albert J.; and Cochran, Bruce C., 4,600,469, Cl. 156-636.000.

Coffey, Fred S.: *See*—
Stotler, David V.; and Coffey, Fred S., 4,600,423, Cl. 65-4.400.

Cohen, Itzchak. Two quadrant power modulator. 4,600,984, Cl. 363-97.000.

Cohen, Samuel H.: *See*—
Robbins, Frederick M.; Allen, Alfred L.; Walker, John E.; and Cohen, Samuel H., 4,600,589, Cl. 426-56.000.

Colby, Jeffrey S. Dual carrying pouch. 4,600,134, Cl. 224-260.000.

Cole, Bill W., to Standard Oil Company (Indiana). Continuous fiber inserts for injection molded parts. 4,600,617, Cl. 428-64.000.

Cole, S. Warren. Thermosiphon solar water heater having freeze rupture protection. 4,599,994, Cl. 126-420.000.

Collagen Corporation: *See*—
Chu, George, 4,600,533, Cl. 530-356.000.

Collonia, Harald, to VDO Adolf Schindling AG. Electric device for eliminating the jerking of vehicles. 4,599,980, Cl. 123-339.000.

Colorado State University Research Foundation: *See*—
Dale, Bruce E., 4,600,590, Cl. 426-69.000.

Colt Industries Operating Corp: *See*—
Latzko, Richard I.; Marsland, George H.; and Reuteler, Johann F., 4,599,769, Cl. 29-26.00A.

Colucci, Stephen L.: *See*—
Carlson, James D.; and Colucci, Stephen L., 4,600,622, Cl. 428-135.000.

Combs, Bernard M.: *See*—
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.

Comer, William T.: *See*—
Pircio, Anthony W.; Buyniski, Joseph P.; and Comer, William T., 4,600,578, Cl. 424-78.000.

Comerford, Matthias F., to Hollis Automation, Inc. Method and apparatus for mass soldering with subsequent reflow soldering. 4,600,137, Cl. 228-102.000.

Commissariat a l'Energie Atomique: *See*—
Barraud, Andre ; and Lelcuf, Jean, 4,599,969, Cl. 118-429.000.
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.
Huet, Jacques, 4,600,998, Cl. 364-507.000.

Communications Satellite Corporation: *See*—
Horna, Otakar A., 4,600,815, Cl. 179-170.200.

Compagnie d'Electronique et de Piezo-Electricite: *See*—
Renoult, Patrick; and Marotel, Gerard, 4,600,900, Cl. 331-116.00R.

Compton, William A.: *See*—
Metcalfe, Arthur G.; Napier, James C.; and Compton, William A., 4,600,414, Cl. 55-290.000.

Conchemco, Incorporated: *See*—
Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., 4,599,912, Cl. 74-501.00R.

Connelly, Fredrick J.: *See*—
Guevarra, Alfredo L.; and Connelly, Fredrick J., 4,600,440, Cl. 106-211.000.

Conner, Jesse R., to Chem-Technics, Inc. Controlled gel time for solidification of multi-phased wastes. 4,600,514, Cl. 210-751.000.

Conoco Inc.: *See*—
Yoon, Heeyoung; and Statnick, Robert M., 4,600,568, Cl. 423-242.000.
Yoon, Heeyoung, 4,600,569, Cl. 423-243.000.

Conrad, Andrew: *See*—
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.

Consolidated Papers, Inc.: *See*—
Michler, James R., 4,599,777, Cl. 29-239.000.

Container Corporation of America: *See*—
Heisler, Jerome S., 4,599,782, Cl. 29-428.000.

Continental Can Company, Inc.: *See*—
Segredo, Anthony F.; Prendergast, Richard E.; Martin, Ralph E.; and Pluister, Jack W., 4,600,347, Cl. 413-26.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Dudziak, Karl-Heinz, 4,600,045, Cl. 152-526.000.

Contois, Lawrence E.: *See*—
Ng, Yee S.; Contois, Lawrence E.; Mitchell, John D.; and Walling, James D., 4,600,669, Cl. 430-47.000.

Coombes, Robert L.; and Huesken, Kay, to Crown City Plating. Method for selectively plating plastics. 4,600,480, Cl. 204-20.000.

Coombs, Daniel M.: *See*—
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Howell, Jerald A., 4,600,504, Cl. 208-251.00H.

Coons, Mark E.: *See*—
Reuter, Gerald L.; and Coons, Mark E., 4,600,708, Cl. 514-78.000.

Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., to Syntex (U.S.A.) Inc. Processes and intermediates for making 16-phenoxy and 16-substituted phenoxy-prostatrienoic acid derivatives. 4,600,785, Cl. 549-212.000.

Cooper Industries: *See*—
Naia, Michael, 4,600,101, Cl. 206-422.000.

Corain, Luciano, to Nuovo Pignone S.p.A. Process and device for the formation of a tucked selvedge, especially suitable for terry looms. 4,600,039, Cl. 139-434.000.

Cordis Corporation: *See*—
Schroeppel, Edward A., 4,600,017, Cl. 128-784.000.

Cormier, Roland: *See*—
Artigue, Francis; Cormier, Roland; and Francois, Christian, 4,600,067, Cl. 177-211.000.

Corning Glass Works: *See*—
Kindle, Karen L.; Mainzer, Stanley E.; Marlatt, Deborah L.; and Sawyer, Constance B., 4,600,693, Cl. 435-176.000.

Correa, John A.: *See*—
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.

Corte, George E., to Diversey Wyandotte Corporation. Method of low temperature bleaching with reduced amounts of chlorine requiring reduced bleaching intervals. 4,600,406, Cl. 8-108.00R.

Cortesi, Vincent T.: *See*—
MacKeighen, Harold R.; and Cortesi, Vincent T., 4,600,728, Cl. 521-84.100.

Cosentino, Giuseppe; and Provera, Franco, to Ing. C. Olivetti & C., S.p.A. Print apparatus for videotex terminal. 4,600,808, Cl. 179-2.0DP.

Costikyan, Kathryn R.: *See*—
Childs, Margaret; and Costikyan, Kathryn R., 4,599,749, Cl. 2-199.000.

Cottrell, Walker C., Jr. Sensitivity recalibration system for body search metal detectors. 4,600,882, Cl. 324-202.000.

Coules, Russell G., to Heath Company. Gripper force sensor/controller for robotic arm. 4,600,357, Cl. 414-730.000.

Counihan, James. Planar section fastening system. 4,599,842, Cl. 52-586.000.

Counsel, Eugene F., to UTM Power Products, Inc. Electric tap connector. 4,600,264, Cl. 339-247.000.

Couper, William D.: *See*—
Nieman, Gerald R.; Thompson, James E.; Couper, William D.; and Clyatt, Clarence L., III, 4,600,262, Cl. 339-147.00R.

Courduvelis, Constantine I., to Enthone, Incorporated. Reclamation of a palladium-tin based electroless plating catalyst from the exhausted catalyst solution and accompanying rinse waters. 4,600,699, Cl. 502-24.000.

Coussau, Jean; and Lavaleric, Claude, to Framatome & Cie. Temporary obturation panel of a passage inside a vessel accessible only through an orifice of smaller size. 4,600,115, Cl. 220-327.000.

Cramer, Wilhelm; and Schrewe, Manfred, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Storage battery. 4,600,664, Cl. 429-7.000.

Cramp, John H. W.; and Reid, Robert F., to Imperial Chemical Industries PLC. Optical fibre sensor. 4,600,310, Cl. 356-432.000.

Crane, Paul W.; and Kusche, David W., to Brunswick Corporation. Cowl latch for outboard motors. 4,600,396, Cl. 440-77.000.

Creighton, Edward, to Evode Limited. Adhesive compositions. 4,600,745, Cl. 524-534.000.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Substituted 3,4-diamino-1,2,5-thiadiazoles having histamine H_2-receptor antagonist activity. 4,600,779, Cl. 548-135.000.

Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, to Societe Cortial, S.A. 4'-flavonecarboxylic acids and pharmaceutically acceptable derivatives their preparation, and their application. 4,600,788, Cl. 549-403.000.

Crismatec: *See*—
Lissalde, Francois; Bathelet, Pierre; Ferrieu, Bruno; and Brochier, Michel, 4,600,564, Cl. 422-249.000.

Criss, Russell C.: *See*—
Gillery, F. Howard; and Criss, Russell C., 4,600,490, Cl. 204-298.000.

Croisier, Alain, to International Business Machines Corp. Multipoint system for interconnecting work stations. 4,601,030, Cl. 370-88.000.

Croudace, Michael C.: *See*—
Jessup, Peter J.; Brass, Stephen G.; and Croudace, Michael C., 4,600,408, Cl. 44-70.000.

Crown City Plating: *See*—
Coombes, Robert L.; and Huesken, Kay, 4,600,480, Cl. 204-20.000.

Cryomec, Incorporated: *See*—
Lutjens, Robert D.; and Zarate, Robert A., 4,599,868, Cl. 62-53.000.

Cuisia, Dionisio G.; and Hwa, Chih M., to W. R. Grace & Co. Composition and method for inhibiting scale. 4,600,524, Cl. 252-181.000.

Cummings, Ralph L.; and Clark, Marshall L., to Wyle Laboratories. Sodium fire simulation process. 4,600,695, Cl. 436-2.000.

Cunniff, William B.; and Tyler, Walter, to Manufacturing Administrations Management Systems, Inc. Automated system for establishing telephone voice connections. 4,600,814, Cl. 179-18.0BC.

Cybot, Inc.: *See*—
Johnson, Roger F., 4,600,355, Cl. 414-680.000.

Dabich, Robert M. Thermo expansion compensator. 4,600,114, Cl. 220-85.00B.

Dabringhaus, Gustav, deceased; by Dabringhaus, Vera, personal representative; and Miller, Michael A. Control means for knee of metal cutting apparatus. 4,600,342, Cl. 409-227.000.

Dabringhaus, Vera, personal representative: *See*—
Dabringhaus, Gustav, deceased; Dabringhaus, Vera, personal representative; and Miller, Michael A., 4,600,342, Cl. 409-227.000.

Dachniwskyj, Maryam L.: *See*—
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,599,807, Cl. 34-9.000.

Dahlgren, Donald A. Electrodialysis apparatus and method of electrodialysis employing same. 4,600,487, Cl. 204-182.400.

Dahlgren, Douglas L., to Allmand Bros. Inc. Portable light support apparatus. 4,600,980, Cl. 362-385.000.

Daido Metal Company Ltd.: *See*—
Mori, Sanae, 4,600,317, Cl. 384-117.000.

Dailey Petroleum Services Corp.: *See*—
Beasley, Thomas R., 4,600,063, Cl. 175-325.000.

Daimler-Benz Aktiengesellschaft: *See*—
Huber, Guntram; Gmeiner, Gunter; and Krugener, Rolf, 4,600,237, Cl. 296-223.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, 4,600,287, Cl. 354-299.000.

Daiwa Company Limited: *See*—
Takagi, Kaneyuki; Kawai, Yoichi; and Kamiya, Yoshiyasu, 4,600,748, Cl. 525-133.000.

Dalal, Rajendra P. Process for generating steam for power generation by utilizing hydrogen and oxygen obtained by electrolysis of water. 4,599,865, Cl. 60-673.000.

Dale, Bruce E., to Colorado State University Research Foundation. Method for increasing the reactivity and digestibility of cellulose with ammonia. 4,600,590, Cl. 426-69.000.

Dalrymple, John C.: *See*—
Paul, Byron G.; Maynard, James H.; and Dalrymple, John C., 4,601,021, Cl. 364-521.000.

Damen, Johannes P. M.; Prijs, Klaas; Witmer, Cornelis H. M.; and de With, Gijsbertus, to U. S. Philips Corporation. Glass-bonded magnetic head having diffusion barriers. 4,600,957, Cl. 360-120.000.

Dandridge, Anthony: *See*—
Koo, Kee P.; Dandridge, Anthony; Tveten, Alan B.; and Sigel, George H., Jr., 4,600,885, Cl. 324-244.000.

Dane, John A. Linear collector for a parabolic reflector. 4,599,995, Cl. 126-438.000.

Dangschat, Rainer, to Siemens Aktiengesellschaft. Method to switch-off the standby operation of a television receiver. 4,600,948, Cl. 358-190.000.

Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Free radical initiated polymerization of polymerizable ethylenically unsaturated monomer component in the presence of hydrogen peroxide. 4,600,755, Cl. 526-81.000.

Data General Corporation: *See*—
Gershenson, Edward; Lemone, Louis A.; and Faletra, Salvatore, 4,600,990, Cl. 364-200.000.

Datascope Corporation: *See*—
Liston, Max D.; Braig, James R.; Blackburn, Wayne; and Hsei, Paul, 4,600,412, Cl. 55-189.000.

Datwyler, Max, to MDC Max Datwyler Bleienbach AG. Wrap-on printing plate structures and assemblies. 4,599,944, Cl. 101-378.000.

Daubert, Richard F.: *See*—
Sutenbach, Paul M.; Peek, Brian R.; and Daubert, Richard F., 4,600,344, Cl. 411-435.000.

Dawson, Wayne. Adjustable releasable cable coupling device. 4,599,913, Cl. 74-501.00R.

Dayton Reliable Tool & Mfg. Co.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,599,884, Cl. 72-346.000.

De Ondernemingen S.B.B.M.: *See*—
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, 4,600,338, Cl. 405-74.000.

Dea, Richard F.: *See*—
Dunn, William R.; and Dea, Richard F., 4,599,914, Cl. 74-563.000.

de Agudelo, Magdalena M.: *See*—
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., 4,600,703, Cl. 502-210.000.

Dearing, Arthur G.: *See*—
York, Troy F.; and Dearing, Arthur G., 4,600,042, Cl. 141-98.000.

Debbaut, Christian A. M., to Raychem Corporation. Apparatus and method for protection of electrical contacts. 4,600,261, Cl. 339-116.00C.

Debely, Pierre E.: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

DeChamp, David W.; and Clayatt, Clarence L., III, to ITT Corporation. Coaxial connector. 4,600,263, Cl. 339-177.00R.

Deere & Company: *See*—
Lundie, William R.; and Olson, Jay H., 4,600,122, Cl. 221-211.000.
Weiss, Heinz; and Gelb, Herbert, 4,600,236, Cl. 296-190.000.
Winter, David C.; and Long, John D., 4,600,060, Cl. 172-4.000.

De Forrest, William. Gate lock structure. 4,599,875, Cl. 70-95.000.

DeGhetto, Kenneth A., to Foster Wheeler Energy Corporation. Contamination removal system. 4,600,508, Cl. 210-170.000.

Degnan, Thomas F., Jr.: *See*—
Angevine, Philip J.; Degnan, Thomas F., Jr.; and Landis, Michael E., 4,600,503, Cl. 208-251.00H.

Deguchi, Yoshihiro: *See*—
Igata, Kouichi; Deguchi, Yoshihiro; and Kobayashi, Masaaki, 4,600,952, Cl. 360-10.300.

Deguchi, Yutaka; and Shibata, Yoshitaka, to Sanyo Electric Co., Ltd. Microstripline for use in microwave heating. 4,600,822, Cl. 219-10.55A.

de Jongh, Rudolph O.; and van Dijk, Cornelis, to Internationale Octroi Maatschappij "Octropa" B.V. Nickel-boride polymer catalyst. 4,600,701, Cl. 502-159.000.

Delagi, Richard: *See*—
Trenkler, George; Delagi, Richard; Britton, Charles; and Schwensfeir, Robert J., Jr., 4,599,771, Cl. 29-155.00R.

Delannoy, Robert G., to Molinier S. A. Device for handling elongated webs. 4,600,465, Cl. 156-351.000.

Delta International Machinery Corp.: *See*—
Ashworth, Steven W., 4,600,184, Cl. 269-303.000.

DeMars, Robert A. Refuse container having self-contained scoop and lid. 4,600,113, Cl. 220-1.00T.

Dennis Smith Consulting Limited: *See*—
Smith, Dennis C.; and Maijer, Rolf, 4,600,383, Cl. 433-9.000.

Dennison National Company: *See*—
Podosek, Edward, 4,600,346, Cl. 412-3.000.

Derivaz, Jean-Pierre: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

Design Institute America, Inc.: *See*—
Evans, Paul R., 4,599,950, Cl. 108-150.000.

Designs for Comfort, Inc.: *See*—
Childs, Margaret; and Costikyan, Kathryn R., 4,599,749, Cl. 2-199.000.

Desilets, Brian H.; Gunther, Thomas A.; Hendricks, Charles J.; and Keller, John H., to International Business Machines Corporation. Plasma etching reactor with reduced plasma potential. 4,600,464, Cl. 156-345.000.

Desmarchais, Walter E.: *See*—
Katz, Leonard R.; and Desmarchais, Walter E., 4,600,553, Cl. 376-292.000.

DeSoto, Inc.: *See*—
Leo, A. Frank, 4,600,649, Cl. 428-412.000.
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,599,807, Cl. 34-9.000.

Deutsche Babcock Werke Aktiengesellschaft: *See*—
Meier, Hans-Joachim, 4,599,952, Cl. 110-216.000.
Willach, Rudolf; and Dibowski, Gunter, 4,600,157, Cl. 241-59.000.

de Vries, Robert. Tube coupling. 4,600,223, Cl. 285-319.000.

de With, Gijsbertus: *See*—
Damen, Johannes P. M.; Prijs, Klaas; Witmer, Cornelis H. M.; and de With, Gijsbertus, 4,600,957, Cl. 360-120.000.

Dhein, Rolf: *See*—
Meyer, Rolf-Volker; Dhein, Rolf; Brassat, Bert; and Hagemann, Hermann, 4,600,752, Cl. 525-424.000.

Dibowski, Gunter: *See*—
Willach, Rudolf; and Dibowski, Gunter, 4,600,157, Cl. 241-59.000.

Dickakian, Ghazi B., to Exxon Chemical Patents Inc. Water-soluble polyamine additive for removal of suspended solids. 4,600,500, Cl. 208-177.000.

Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Freitag, Dieter; and Sayed, Aziz E., to Bayer Aktiengesellschaft. Thermotropic aromatic polyesters with good rigidity and toughness, process for the production thereof and the use thereof for the production of mouldings, filaments fibres and films. 4,600,764, Cl. 528-128.000.

Didriksen, Erik J., to Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselkab). Pharmaceutical preparations of pinacidal. 4,600,577, Cl. 424-20.000.

Diederich, Perry, to Psi Star Incorporated. Plasma reactor with voltage transformer. 4,600,563, Cl. 422-186.290.

Diehl GmbH & Co.: *See*—
Kastenhuber, Manfred; Eckel, Alfred; and Bock, Erich, 4,600,167, Cl. 244-3.280.

Diephouse, Tim R.; LaTulip, Randy J.; Robinson, John W.; and Gantt, Gary R., to Dow Chemical Company, The. Thermostable hydroxystyrylaza compounds. 4,600,767, Cl. 528-252.000.

Diggens, Albert: *See*—
Bromberg, Edward E. A.; Diggens, Albert; West, Steven J.; and Ross, James W., 4,600,494, Cl. 204-401.000.

DiMartino, John M., Sr., to Tandemloc, Inc. Modular container building system. 4,599,829, Cl. 52-79.700.

Dingwall, Robert P.: *See*—
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.

Dinsky, Seth: *See*—
Barouh, Victor; and Dinsky, Seth, 4,600,372, Cl. 425-128.000.

Di Paolo, Giancarlo. Device for transforming cycles or similar into multiple capacity vehicles for more occupants. 4,600,206, Cl. 280-231.000.

Diperstein, David. Method of repairing cracked thin metal parts. 4,599,781, Cl. 29-402.110.

Disko, Harry: *See*—
Rosenwinkel, Donald A.; and Disko, Harry, 4,600,393, Cl. 434-88.000.

DiStefano, Thomas H.; and Johnson, Mark, to International Business Machines Corporation. Optical scanning apparatus with dynamic scan path control. 4,600,837, Cl. 250-235.000.

Dito Sama: *See*—
Bos, Pierre H.; Musseau, Joel R.; and Richard, Jean-Pierre, 4,600,155, Cl. 241-37.500.

Diversey Wyandotte Corporation: *See*—
Corte, George E., 4,600,406, Cl. 8-108.00R.

Dobel AB: *See*—
Ingvarsson, Lars, 4,599,843, Cl. 52-729.000.

Dobel AB and Stalbyggnadsinstitutet: *See*—
Ingvarsson, Lars I.; and Ramsden, Jonathan A., 4,599,840, Cl. 52-340.000.

Dobis, Arlene. Means for decorating comestible products. 4,600,592, Cl. 426-112.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Stelter, Norbert; Wuest, Rainer; op de Beeck, Peter; and Bofginer, Gerd, 4,599,918, Cl. 74-866.000.

Dr. Johannes Heidenhain GmbH: *See*—
Miller, Walter; and Kraus, Heinz, 4,600,203, Cl. 277-237.00R.

Dr. Werner Freyberg Chemische Fabrik Delitia Nachf: *See*—
Friemel, Wolfgang F. R.; and Praxl, Werner O., 4,600,584, Cl. 424-128.000.

Doemens, Guenter; and Mengel, Peter, to Siemens Aktiengesellschaft. Apparatus for testing electrical microprinted circuits utilizing ionizing gas for providing electrical connections. 4,600,878, Cl. 324-51.000.

Doherty, Robert J.; and Allan, Joseph J., to United States of America, Navy. Method for bonding a thin sheet to a rigid body. 4,600,455, Cl. 156-64.000.

Dohi, Yozi: *See*—
Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, 4,600,287, Cl. 354-299.000.

Dohnomoto, Tadashi; and Tanaka, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Composite material with carbon reinforcing fibers and magnesium alloy matrix including zinc. 4,600,661, Cl. 428-614.000.

Dolak, Terence M.; and Martin, Tellis A., to Mead Johnson & Company. Isoindole derivatives. 4,600,758, Cl. 546-200.000.

Dolezal, F. Wesley: *See*—
Girone, Joseph M.; and Dolezal, F. Wesley, 4,599,890, Cl. 73-37.000.

Donachie, Stephen J.; and Gilman, Paul S., to Inco Alloys International, Inc. Dispersion strengthened mechanically alloyed Al-Mg-Li. 4,600,556, Cl. 420-542.000.

Donaldson Company, Inc.: *See*—
Wydeven, Robert M.; and Gehl, Warren, 4,600,420, Cl. 55-501.000.

Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., to Mobil Oil Corporation. Grease composition containing boronated alcohols, and hydroxy-containing thickeners. 4,600,517, Cl. 252-32.70E.

Donnelly, Norbert B. Anti-vibration device for sports rackets. 4,600,194, Cl. 273-73.00G.

Doring, Joachim: *See*—
Zabrocki, Karl; Lindner, Christian; Muller, Friedmann; and Doring, Joachim, 4,600,747, Cl. 525-83.000.

Doshi, Navin H. Volume measuring apparatus. 4,599,892, Cl. 73-49.200.

Dost, Willibald; Habenschaden, Kurt; Kreutzer, Hans; and Wasner, Gunter, to Siemens Aktiengesellschaft. Mounting arrangement for optical components. 4,600,272, Cl. 350-287.000.

Doutre, Don A.; and Guthrie, Roderick I. L., to Limca Research Inc. Apparatus for the detection and measurement of particulates in molten metal. 4,600,880, Cl. 324-71.100.

Douy, Andre : *See*—
Gallot, Bernard; and Douy, Andre , 4,600,526, Cl. 252-299.010.

Dover Corporation: *See*—
Johnson, Ronald W., 4,599,876, Cl. 70-344.000.

Dow Chemical Company, The: *See*—
Diephouse, Tim R.; LaTulip, Randy J.; Robinson, John W.; and Gantt, Gary R., 4,600,767, Cl. 528-252.000.
Hefner, Robert E., Jr., 4,600,760, Cl. 526-262.000.
Lancaster, Gerald M.; and Allen, James A., 4,600,614, Cl. 428-35.000.
Stutts, Kenneth J., 4,600,478, Cl. 204-59.00R.
Tomalia, Donald A.; and Wilson, Larry R., 4,600,535, Cl. 260-239.30R.

Dow Corning Corporation: *See*—
Lee, Chi-long; and Shyu, Wen-Bin, 4,600,751, Cl. 525-404.000.

Dowbenko, Rostyslaw: *See*—
Das, Suryya K.; and Dowbenko, Rostyslaw, 4,600,755, Cl. 526-81.000.

Doyle, Beryle S.; and Peek, Brian R., to Illinois Tool Works Inc. Spin welded fastening assembly. 4,599,768, Cl. 24-590.000.

Drahnak, Timothy J., to Minnesota Mining and Manufacturing Company. Hydrosilation process using a (η^5-cyclopentadienyl)tri(σ-aliphatic) platinum complex as the catalyst. 4,600,484, Cl. 204-157.740.

Dreier, Ernst: *See*—
Lahodny, Johann; and Dreier, Ernst, 4,600,007, Cl. 128-318.000.

Dresner, Joseph, to RCA Corporation. Back-to-back diodes. 4,600,935, Cl. 357-58.000.

Dresser Industries, Inc.: *See*—
Wang, Ke-Chin; Rushe, Eugene T.; and Winkelbauer, Howard M., 4,600,607, Cl. 427-421.000.

Drever, Leslie C. Microphone wind shroud. 4,600,077, Cl. 181-242.000.

Dreyfuss, Wilfried; Remp, Thomas E.; and Muller, Kurt, to Dreyfuss, Wilfried; and Remp, Thomas E. Installing or centering mechanism for pipes to be screwed into one another. 4,599,778, Cl. 29-272.000.

Dritz, Theodore D. Marine propulsion unit. 4,600,394, Cl. 440-38.000.

Dubarko, Donald L., to Tektronix, Inc. Latch and detent mechanism for sliding tray. 4,600,255, Cl. 312-333.000.

Dubrovsky, Michael: *See*—
Hubred, Gale L.; and Dubrovsky, Michael, 4,600,483, Cl. 204-130.000.

Dudziak, Karl-Heinz, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,600,045, Cl. 152-526.000.

Dugot, Richard S., to Biolectron, Inc. Electric stimulator and test instrument therefor. 4,600,010, Cl. 128-419.00F.

Dunkerton, Stephen H.; Petreye, David R.; Erickson, Gary D.; and Reynolds, Gary R., to Motorola, Inc. Paging universal remote control encoder. 4,600,922, Cl. 340-825.440.

Dunn, William R.; and Dea, Richard F. Bicycle pedal grips. 4,599,914, Cl. 74-563.000.

Du Pont de Nemours, E. I., and Company: *See*—
Aufdermarsh, Carl A.; Harder, Robert J.; and Spiegelman, Phillip P., 4,600,651, Cl. 428-422.000.
Bartlett, Philip L., 4,600,530, Cl. 252-392.000.
Siuta, Vincent P., 4,600,604, Cl. 427-216.000.
Stout, Richard W., 4,600,646, Cl. 428-405.000.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Ltd. Pharmacologically active compounds. 4,600,720, Cl. 514-340.000.

Duro-Dyne Corporation: *See*—
Hinden, Milton; and Giannone, Charles, 4,600,345, Cl. 411-447.000.

Durst, Douglas G.; and Morris, Arthur J., to Camco, Incorporated. Tubular well tool receiving conduit. 4,600,055, Cl. 166-115.000.

Dutina, Hans, to Hans Dutina AB. Method of guiding saw blades and device for carrying out the method. 4,599,929, Cl. 83-821.000.

Duyckinck, Robert W. Carbon black mill. 4,600,156, Cl. 241-56.000.

Dwulet, Michaelene, to Multi-Tex Products Corp. Composite yarn product and method of preparation. 4,600,643, Cl. 428-375.000.

Dydyk, Michael, to Motorola, Inc. Planar radial resonator oscillator-/amplifier. 4,600,894, Cl. 330-287.000.

Dyroff, David R.; Burke, Edward J.; Vanderlinde, William; and Backes, Thomas W., to Monsanto Company. Process for preparing polymeric acetal carboxylates. 4,600,750, Cl. 525-398.000.

E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Knauss, Hermann, 4,599,993, Cl. 126-374.000.

E. J. Brooks Company: *See*—
Agnelli, Frank J., 4,600,220, Cl. 285-80.000.

E. R. Squibb & Sons, Inc.: *See*—
Sykes, Richard B.; and Tymiak, Adrienne, 4,600,786, Cl. 549-263.000.

Eastman Kodak Company: *See*—
Bietry, Joseph R., 4,500,276, Cl. 350-432.000.
Braun, Hilarion; and Piatt, Michael J., 4,600,928, Cl. 346-1.100.
Hage, Charles T., 4,600,296, Cl. 355-16.000.
Harvey, Donald M., 4,600,286, Cl. 354-212.000.
Harvey, Frederick W., 4,600,285, Cl. 354-212.000.
Jackson, Winston J., Jr.; and Watkins, Joseph J., 4,600,768, Cl. 528-308.000.
Ng, Yee S.; Contois, Lawrence E.; Mitchell, John D.; and Walling, James D., 4,600,669, Cl. 430-47.000.
Regruit, Curtis R., 4,600,955, Cl. 360-99.000.

Ebigt, Joachim: *See*—
Hermann, Hans D.; Fock, Kurt; Fabian, Klaus; and Ebigt, Joachim, 4,600,655, Cl. 428-437.000.

Eccardt, Curtis J.; and Smith, Arnold L., to Emerson Electric Co. Tool elevation and bevel adjustment for direct drive power tool. 4,599,927, Cl. 83-473.000.

Eck, Herbert; Menzel, Hartmut; Jira, Reinhard; and Prasse, Alfred, to Wacker-Chemie GmbH. Silicon compounds containing SiC-bonded biuret groups and a method for preparing the same. 4,600,790, Cl. 556-421.000.

Eckel, Alfred: *See*—
Kastenhuber, Manfred; Eckel, Alfred; and Bock, Erich, 4,600,167, Cl. 244-3.280.

Economy Distributors, Inc.: *See*—
Magaha, George H., Jr., 4,599,831, Cl. 52-98.000.

Edman, Walter W.; and Klemm, Ernest J., to Zotos International Inc. Saturated end wrap construction and composition. 4,600,028, Cl. 132-7.000.

Edwards, Charles C. External fixation system. 4,600,000, Cl. 128-92.00A.

Edwards Engineering Corporation: *See*—
Edwards, Ray C., 4,600,476, Cl. 202-84.000.

Edwards, Leon. Tobacco separation pretreatment system. 4,600,024, Cl. 131-299.000.

Edwards, Ray C., to Edwards Engineering Corporation. Apparatus for aboveground separation, vaporization and recovery of oil from oil shale. 4,600,476, Cl. 202-84.000.

Eggleston, Joe E.; and Warren, David R., to Halliburton Company. Line moving apparatus for wireline supported tools. 4,600,059, Cl. 166-385.000.

Egli, Werner H.; and Lenz, James E., to Honeywell Inc. Apparatus and method for determining the range and bearing in a plane of an object characterized by an electric or magnetic dipole. 4,600,883, Cl. 324-207.000.

Eidenschink, Rudolf; and Weber, Georg, to Merck Patent Gesellschaft mit Beschrankter Haftung. Decalin-carbonitriles. 4,600,528, Cl. 252-299.610.

Einhaus, Hermanus F., to U.S. Philips Corporation. Housing with a dust cover having a pivoted front. 4,600,247, Cl. 312-8.000.

EKA AB: *See*—
Larsson, Bernt; Nobelius, Gunilla; and Johansson, Elisabet, 4,600,735, Cl. 523-216.000.

Ekco Products, Inc.: *See*—
Tabler, Charles P., 4,600,103, Cl. 206-505.000.

Ela, Roger B.; and Guerin, Paul H., to Walker Magnetics Group, Inc. Lifting magnet system. 4,600,964, Cl. 361-144.000.

Eli Lilly and Company: *See*—
Abdulla, Riaz F.; and Samaritoni, Jack G., 4,600,430, Cl. 71-92.000.
Engel, Gary L.; Indelicato, Joseph M.; and Rose, Harry A., 4,600,773, Cl. 544-30.000.
Huser, Diane L.; Schaus, John M.; Titus, Robert D.; and Weigel, Leland O., 4,600,777, Cl. 546-164.000.

Elias, John W.: *See*—
Lew, Hyok S.; and Elias, John W., 4,600,974, Cl. 362-102.000.

El-Kareh, Badih: *See*—
Cade, Paul E.; El-Kareh, Badih; and Kim, Ick W., 4,599,792, Cl. 29-576.00W.

Elkins, Tammy M.: *See*—
Cheng, Paul J.; and Elkins, Tammy M., 4,600,496, Cl. 208-44.000.

Ellermann, Jurgen; and Pfeiffenberger, Horst, to Mahle GmbH. Plunger piston for internal combustion engines. 4,599,935, Cl. 92-159.000.

Elliott, E. J. Drum heating and mixing apparatus and method. 4,600,379, Cl. 432-13.000.

Elliott, Robert D.: *See*—
Temple, Carroll G.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,600,716, Cl. 514-249.000.

Ellis, Darwin L.; and Kelly, Frank M., to Aluminum Company of America. Capping head. 4,599,846, Cl. 53-331.500.

Ellison, Robert H.; and Friend, Peter S., to Shell Oil Company. Downflow isomerization of epoxides. 4,600,800, Cl. 568-832.000.

ELTAC Nogler & Daum KG: *See*—
Oppitz, Hans, 4,600,486, Cl. 204-182.300.

Eltech Systems Corporation: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

EM-GE Sportgerate GmbH & Co., KG: *See*—
Scheible, Eberhard, 4,599,817, Cl. 42-1.150.

Emerson Electric Co.: *See*—
Eccardt, Curtis J.; and Smith, Arnold L., 4,599,927, Cl. 83-473.000.
Koller, Frank H., 4,599,909, Cl. 74-27.000.

Emmert, Richard L., to PPG Industries, Inc. Pivotal locking arm for phototool assembly. 4,600,298, Cl. 355-75.000.

Emmett, John C.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,600,720, Cl. 514-340.000.

Emoto, Kazuhiro; and Itoh, Akira, to Mitsubishi Paper Mills, Ltd. Trisazo electrophotographic photoconductive material. 4,600,674, Cl. 430-72.000.

Engel, Gary L.; Indelicato, Joseph M.; and Rose, Harry A., to Eli Lilly and Company. Crystalline cephalexin hydrochloride monohydrate. 4,600,773, Cl. 544-30.000.

Engelstoft, Mogens: *See—*
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.

Engineered Data Products, Inc.: *See—*
Price, Macy J.; and Ball, Laurence G., 4,600,107, Cl. 211-41.000.

Engler, Heidrun: *See—*
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.

Enichimica S.p.A.: *See—*
Pedretti, Ugo; Perego, Giovanni; and Lugli, Gabriele, 4,600,756, Cl. 526-134.000.

Ennis, Richard M.: *See—*
Ennis, William H.; and Ennis, Richard M., 4,600,227, Cl. 294-1.100.

Ennis, William H.; and Ennis, Richard M. Hand-held filter separating device. 4,600,227, Cl. 294-1.100.

Enthone, Incorporated: *See—*
Courduvelis, Constantine I., 4,600,699, Cl. 502-24.000.

Equipment Renewal Company: *See—*
Miller, Jim; Humphries, Jim; and Teel, Toby, 4,600,054, Cl. 166-75.100.

Erb, Robert A. Method for producing breast prostheses and supports. 4,600,551, Cl. 264-222.000.

Erchegyi, Judit: *See—*
Seprodi, Janos; Teplan, Istvan; Mezo, Imre; and Erchegyi, Judit, 4,600,705, Cl. 514-15.000.

Erickson, Gary D.: *See—*
Dunkerton, Stephen H.; Petreye, David R.; Erickson, Gary D.; and Reynolds, Gary R., 4,600,922, Cl. 340-825.440.

Eriksson, Sture, to Armerad Betong Vagforbattringar Aktiebolag. Method for peat mining. 4,600,242, Cl. 299-7.000.

Ernster, John H. Milk protein hydrolysate and process of preparation. 4,600,588, Cl. 426-42.000.

Errey, Keith H.: *See—*
Andrews, Anthony J.; Errey, Keith H.; Kearsley, Andrew J.; and Webb, Colin E., 4,601,040, Cl. 372-57.000.

Escher Wyss GmbH: *See—*
Bartesch, Helmut; and Florin, Gerd, 4,600,594, Cl. 426-443.000.

Essex Group, Inc.: *See—*
Vogel, Ralph A.; and Caudill, Keith E., 4,599,905, Cl. 73-830.000.

ETA SA Fabriques d'Ebauches: *See—*
Besson, Rene , 4,600,316, Cl. 368-187.000.

Etablissements Boulenger: *See—*
Berlemont, Jacques, 4,600,639, Cl. 428-327.000.

Etablissements Montaberg, Societe Anonyme: *See—*
Montabert, Roger, 4,601,000, Cl. 364-513.000.

Eto, Katsuo, to Toshiba Kikai Kabushiki Kaisha. Lever switch. 4,600,818, Cl. 200-5.00R.

Euchner & Co.: *See—*
Hertrich, Wolfgang; and Fritsch, Volker, 4,600,963, Cl. 361-101.000.

Evans, Jack L.: *See—*
Hendrickson, William A.; Evans, Jack L.; Paulson, Kenneth R.; and Wilson, Robert W., 4,600,673, Cl. 430-66.000.

Evans, John M.; and Wise, Colin C., to Antec Systems Limited. Patient monitoring apparatus and method. 4,600,015, Cl. 128-780.000.

Evans, Paul R., to Design Institute America, Inc. Article of furniture and method of making same. 4,599,950, Cl. 108-150.000.

Eveland, Michael: *See—*
Raymer, Doyle; Eveland, Michael; and Heyden, Dennis J., 4,600,148, Cl. 239-29.300.

Everett, Seth L., Jr., to United States of America, Army. Control for dot matrix printers operating in harsh environments. 4,600,319, Cl. 400-54.000.

Evode Limited: *See—*
Creighton, Edward, 4,600,745, Cl. 524-534.000.

Ex-Cell-O Corporation: *See—*
Bradley, Jerome R., 4,600,151, Cl. 239-400.000.
Scrivo, Jerry V., 4,600,312, Cl. 366-159.000.

Explosive Fabricators, Inc.: *See—*
Sharp, William F.; Banker, John G.; and Hardwick, Roy, 4,600,332, Cl. 403-179.000.

Exxon Chemical Patents Inc.: *See—*
Dickakian, Ghazi B., 4,600,500, Cl. 208-177.000.

Exxon Research and Engineering Co.: *See—*
Butler, Kevin D.; and Henderson, Harry E., 4,600,502, Cl. 208-284.000.
Gutierrez, Antonio; O'Halloran, Rosemary; and Brois, Stanley J., 4,600,519, Cl. 252-48.600.

Ezis, Andre: *See—*
Beckwith, Elaine C.; and Ezis, Andre, 4,600,547, Cl. 264-63.000.

Fabian, Klaus: *See—*
Hermann, Hans D.; Fock, Kurt; Fabian, Klaus; and Ebigt, Joachim, 4,600,655, Cl. 428-437.000.

Fairchild Semiconductor Corporation: *See—*
Clark, James W., 4,600,611, Cl. 428-13.000.

Falco, Giulio; and Mannucci, Ivo, to Italimpianti Societa Italiana Impianti p.a. Gas cooling and recirculating device in continuous strip furnaces. 4,600,181, Cl. 266-102.000.

Faletra, Salvatore: *See—*
Gershenson, Edward; Lemone, Louis A.; and Faletra, Salvatore, 4,600,990, Cl. 364-200.000.

Falk, Leonard P.; and Stadler, Robert L., to UniDynamics Corporation. Article vendor. 4,600,121, Cl. 221-130.000.

Fanuc Ltd.: *See—*
Ishida, Hiroshi; and Ushiyama, Shigeyuki, 4,600,835, Cl. 250-231.0SE.
Nozawa, Ryoichiro; Kawamura, Hideaki; Sasaki, Takao; and Hirose, Satoru, 4,600,985, Cl. 364-169.000.

Farina, Attilio: *See—*
Belisomi, Pietro; and Farina, Attilio, 4,600,918, Cl. 340-711.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Angelucci, Francesco; Penco, Sergio; and Arcamone, Federico, 4,600,537, Cl. 260-351.100.

Faxvog, Frederick R.; and Mocker, Hans W., to Honeywell Inc. Rapidly tunable laser. 4,601,036, Cl. 372-20.000.

Fay, Bernard, to Thomson-CSF. Process and apparatus for theoptical alignment of patterns in two close-up planes in an exposure means incorporating a divergent radiation source. 4,600,309, Cl. 356-401.000.

Fedora, Joseph; and Zajechowski, Fred, to Bangor Punta Corporation. Magazine catch. 4,599,818, Cl. 42-7.000.

Feinendegen, Ludwig E.: *See—*
Wyrwich, Helmut; Graschew, Georgi; Chatzipetros, Johann; and Feinendegen, Ludwig E., 4,599,800, Cl. 33-143.00C.

Feinmann, Paul B. Apparatus for the production of small dental prostheses. 4,600,386, Cl. 433-60.000.

Feldman, Steven; and Kimmel, David J., to AMP Incorporated. Telephone line tester. 4,600,810, Cl. 179-175.30R.

Feldmann, Joachim; and Isernhagen, Fritz, to WABCO Fahrzeugbremsen GmbH. Brake lining support in disc brakes. 4,600,090, Cl. 188-218.0XL.

Felske, Arthur M.: *See—*
Harlow, Albert L., Jr.; and Felske, Arthur M., 4,600,143, Cl. 232-17.000.

Feniou, Claude: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.

Fenner America Inc.: *See—*
Soussloff, Dimitri G., 4,600,334, Cl. 403-369.000.

Fernandez, Maria I. M.: *See—*
Chaiet, Louis; Monaghan, Richard L.; Zimmerman, Sheldon B.; and Fernandez, Maria I. M., 4,600,691, Cl. 435-106.000.

Fernandez, Raul F.: *See—*
Kromer, Philip F., III; Srinivasagopalan, Rangarajan; and Fernandez, Raul F., 4,601,044, Cl. 375-17.000.

Ferrari Societa' per Azioni Esercizio Fabbriche Automobili e Corse: *See—*
Materazzi, Nicola, 4,599,977, Cl. 123-52.00M.

Ferreira-Godinho, Manuel. Folder for paper sheets or the like. 4,600,329, Cl. 402-74.000.

Ferrer International, S.A.: *See—*
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.

Ferrieu, Bruno: *See—*
Lissalde, Francois; Bathelet, Pierre; Ferrieu, Bruno; and Brochier, Michel, 4,600,564, Cl. 422-249.000.

Ferris, James E. Air conditioner refrigerant check guide. 4,599,903, Cl. 73-756.000.

Fichter, Peter K., to Polaroid Corporation. Transparency film assemblage. 4,600,680, Cl. 430-207.000.

Fichtner, Hans E.; and Klaus, Franz, to Franz Klaus Union Armaturen Pumpen GmbH & Co. Apparatus for inductively heating fluid. 4,600,821, Cl. 219-10.510.

Fiedler, Bruce H.: *See—*
Heidner, Richard C.; Wetor, Clyde R.; and Fiedler, Bruce H., 4,600,075, Cl. 180-336.000.

Field, Robert W.; Perr, Clarence D.; and Gerlach, Ronald R., to Telease, Inc. Secure coding and decoding system and method for television program signals. 4,600,942, Cl. 358-122.000.

Figuet, Jacques: *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.

Finkl, Charles W.: *See—*
Lehman, Albert L.; and Finkl, Charles W., 4,600,427, Cl. 75-49.000.

Fischle, Martin: *See—*
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,600,977, Cl. 362-362.000.

Fisher Berkeley Corporation: *See—*
Shipley, Robert T., 4,601,064, Cl. 455-608.000.

Fisher, Kenneth J.; and Miller, William R., to American Sterilizer Company. Passive cooling system for a luminaire. 4,600,979, Cl. 362-373.000.

Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., to National Research Development Corporation. Determining the level of contaminants in a hydraulic system. 4,599,893, Cl. 73-61.00R.

Flaming, Dale G. Method of forming an ultrafine micropipette. 4,600,424, Cl. 65-29.000.

Flecto Company, Inc., The: *See—*
Guevarra, Alfredo L.; and Connelly, Fredrick J., 4,600,440, Cl. 106-211.000.

Fleissner, Gerold, to Vepa Aktiengesellschaft. Process for wrapping square bales. 4,599,939, Cl. 100-2.000.

Flemming, Edgar J.: *See—*
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Kleimeyer, David L.; Fletcher, Larry N.; Stacy, Alan D.; and Smillie, Allan M., 4,600,434, Cl. 75-58.000.
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Bartesch, Helmut; and Florin, Gerd, 4,600,594, Cl. 426-443.000.
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Fogt, Eric J., to Medtronic, Inc. Flow through ion selective electrode. 4,600,495, Cl. 204-409.000.
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., to Ferrer International, S.A. N-cyano-formamidines. 4,600,780, Cl. 548-193.000.
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Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,600,769, Cl. 528-322.000.
Fontenot, John E., to NL Industries, Inc. Method for determining borehole stress from MWD parameter and caliper measurements. 4,599,904, Cl. 73-783.000.
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Beckwith, Elaine C.; and Ezis, Andre, 4,600,547, Cl. 264-63.000.
Buscher, Josef, 4,599,775, Cl. 29-159.200.
Patel, Ramchandra L.; and Patel, Chhotubhai N., 4,600,053, Cl. 165-170.000.
Forrester, Charles R. Three-legged stepladder. 4,600,080, Cl. 182-124.000.
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Forster, Rolf, to Bernhard Forster GmbH. Orthodontic appliance. 4,600,382, Cl. 433-5.000.
Fortenberry, Roland D. Sharpening device. 4,599,919, Cl. 76-86.000.
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DeGhetto, Kenneth A., 4,600,508, Cl. 210-170.000.
Fox, Delbert H. Lotto contest number checking device. 4,600,198, Cl. 273-148.00R.
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Gelineau, Frederick D.; and Kinney, Thomas B., 4,599,808, Cl. 34-27.000.
Fraga, Cornelio. Spinning toy. 4,600,398, Cl. 446-240.000.
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Frank, Peter J.; and Hite, Jerry R., to Ashland Oil, Inc. Preparation and recovery of methacrylic acid and its esters. 4,600,795, Cl. 562-599.000.
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Fichtner, Hans E.; and Klaus, Franz, 4,600,821, Cl. 219-10.510.
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Graf, Bernhard, 4,600,358, Cl. 414-749.000.
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Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,599,884, Cl. 72-346.000.
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Salpekar, Anil M.; Freebersyser, Steven R.; and Robinson, Douglas A., 4,600,579, Cl. 424-80.000.
Frei, Willi, to Air Frohlich Ag fur Energieruckgewinnung. Method and device for separating harmful substances from a flue gas. 4,600,561, Cl. 422-170.000.
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, to Bayer Aktiengesellschaft. Two stage process for the production of aromatic polyester-carbonate. 4,600,753, Cl. 525-439.000.
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Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Freitag, Dieter; and Sayed, Aziz E., 4,600,764, Cl. 528-128.000.
Frerejacques, Jean-Claude, to Simmonds S.A. Bolt and assembly using such a bolt. 4,600,343, Cl. 411-303.000.
Fresnel, Jacques. Apparatus for fitting and centering thermoplastic sheath around objects by means of a vertical unit with a floating mandrel. 4,600,371, Cl. 425-110.000.
Freud, Paul J.; and Kroninger, Paul M., Jr., to General Signal Corporation. Remote probe differential pressure transducer. 4,599,906, Cl. 73-861.470.
Friedman, Gary, to Automation Industries, Inc. Workpiece for handling apparatus for nondestructive testing. 4,599,900, Cl. 73-622.000.
Friemel, Wolfgang F. R.; and Praxl, Werner O., to Dr. Werner Freyberg Chemische Fabrik Delitia Nachf. Phosphine producing hydrolyzable metal phosphide and use thereof. 4,600,584, Cl. 424-128.000.
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Ellison, Robert H.; and Friend, Peter S., 4,600,800, Cl. 568-832.000.
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Fritz, Albert E., to Precision Auto Designs, Inc. Method of hoisting an automobile hard top. 4,600,177, Cl. 254-338.000.
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Lahodny, Johann; and Dreier, Ernst, 4,600,007, Cl. 128-318.000.
Fritzsche, Donald E.; Panora, Robert A.; and Bangert, Matthew D., to Hobart Corporation; and Thermo Electron Corporation. Control system and method for recirculating-type deep fat fryer. 4,599,990, Cl. 126-351.000.
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Fudatsuji, Toshiharu; Gooda, Kazuhiro; and Imazeki, Takao, to Fujitsu Limited. Casing structure for electrical and mechanical units. 4,600,326, Cl. 400-691.000.
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Sekiya, Tsuneto; Matsuura, Osamu; and Huruhata, Shooichi, 4,600,968, Cl. 361-394.000.
Tominaga, Hiroshi, 4,599,755, Cl. 5-453.000.
Uchida, Naoshi; and Kandatsu, Kiyoshi, 4,600,908, Cl. 335-8.000.
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Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, 4,600,851, Cl. 310-324.000.
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Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,600,638, Cl. 428-323.000.
Nakamura, Taku; Hirano, Mitsunori; Ogawa, Masasi; and Ishigaki, Kunio, 4,600,687, Cl. 430-529.000.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,600,641, Cl. 428-355.000.
Ohtsuka, Shuichi; Yoda, Akira; Kimura, Akinori; and Takahashi, Isoji, 4,600,291, Cl. 355-3.00R.
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Fujine, Sachio; Saito, Keiichiro; and Shiba, Koreyuki, to Japan Atomic Energy Research Institute. Method of lithium isotope separation. 4,600,566, Cl. 423-179.500.
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Fujita, Yasuhiko: *See*—
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,600,916, Cl. 340-347.0AD.
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Arakawa, Hideki; and Kawashima, Hiromi, 4,601,020, Cl. 365-226.000.
Fudatsuji, Toshiharu; Gooda, Kazuhiro; and Imazeki, Takao, 4,600,326, Cl. 400-691.000.
Kato, Motokazu, 4,601,008, Cl. 364-900.000.
Kitakohji, Toshisuke; Takeda, Shiro; Nakajima, Minoru; and Tokunaga, Hiroshi, 4,600,685, Cl. 430-313.000.
Kitano, Kouichi; and Isogai, Hideaki, 4,601,014, Cl. 365-155.000.
Mochizuki, Hirohiko; Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,601,017, Cl. 365-189.000.
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Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,600,638, Cl. 428-323.000.
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Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, 4,600,941, Cl. 358-121.000.
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Ichihashi, Mikio; Fukuhara, Satoru; Okumura, Masahide; and Murakoshi, Hisaya, 4,600,839, Cl. 250-310.000.
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Fukumoto, Kazuhiro: *See*—
Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, 4,600,437, Cl. 106-74.000.

Fukumoto, Takaaki; Hama, Masaharu; and Kayano, Shinpei, to Mitsubishi Denki Kabushiki Kaisha. Device for continuously monitoring the density of atmospheric sodium ions. 4,600,888, Cl. 324-439.000.

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Orren, David R. N., 4,600,098, Cl. 198-773.000.

Fuller, Ray C.: *See*—
Hardt, Ivan E.; Bonebright, Cynthia A.; and Fuller, Ray C., 4,601,043, Cl. 375-1.000.

Furuhata, Takashi; Nakama, Taihei; and Masuda, Yoshinori, to Hitachi, Ltd. Head switching signal producing circuit for a magnetic recording and reproducing apparatus. 4,600,953, Cl. 360-10.300.

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Fusco, Albert J.; and Cochran, Bruce C., to Honeywell Inc. Method for polishing detector material. 4,600,469, Cl. 156-636.000.

Fushimoto, Hideo, to Canon Kabushiki Kaisha. Electronic memory device. 4,600,257, Cl. 339-40.000.

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Liang, Chi-Dean; and Walsh, Gerald M., 4,600,710, Cl. 514-357.000.

G.D Societa' per Azioni: *See*—
Mattei, Riccardo; and Belvederi, Bruno, 4,600,020, Cl. 131-84.400.
Mattei, Riccardo, 4,600,021, Cl. 131-110.000.

Gaf Corporation: *See*—
Barabas, Eugene S., 4,600,759, Cl. 526-207.000.

Gagescu, Dan: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

Gagliani, John; and Long, John V. Water soluble imide coating composition and method of making from lactam, dianhydride and diamine. 4,600,770, Cl. 528-322.000.

Gagnon, Pierre; and LaForest, Pierre. Platform lift. 4,600,085, Cl. 187-24.000.

Gaitanopoulos, Dimitri; and Weinstock, Joseph, to SmithKline Beckman Corporation. Fenoldopam 4',8-bis-hydrogen sulfate and dopaminergic use thereof. 4,600,714, Cl. 514-213.000.

Gaither, Paul I.; and Tucker, Joseph R., III, to Reed Tool Company. Method and apparatus for machining a workpiece. 4,599,921, Cl. 82-1.00C.

Galasso, Francis S.: *See*—
Veltri, Richard D.; and Galasso, Francis S., 4,600,182, Cl. 266-286.000.

Galbraith, Lyle D., to Rocket Research Company, a division of Rockor, Inc. Propellant augmented pressurized gas dispensing device. 4,600,123, Cl. 222-3.000.

Galli, Carlo. Device for the production of ice-cream cones and the product obtained. 4,600,591, Cl. 426-94.000.

Galli, Paolo; and Parrini, Paolo, to Montecatini Edison S.p.A. Process for the preparation of fibers from polymeric materials. 4,600,545, Cl. 264-11.000.

Gallia, James D.: *See*—
Shah, Ashwin H.; Gallia, James D.; Wang, I-Fay; and Mahant-Shetti, Shivaling S., 4,601,019, Cl. 365-200.000.

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Galuschak, George; and Stomber, Richard J., to Singer Company, The. Heading indicator and method of using. 4,599,803, Cl. 33-301.000.

Game Tracker, Inc., The: *See*—
Rezmer, Leonard D., 4,599,987, Cl. 124-23.00R.

Gammenthaler, Robert S. Communications control circuit with adaptive timing. 4,601,059, Cl. 455-54.000.

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Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,600,720, Cl. 514-340.000.

Ganrot, Bertil A.: *See*—
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Gantt, Gary R.: *See*—
Diephouse, Tim R.; LaTulip, Randy J.; Robinson, John W.; and Gantt, Gary R., 4,600,767, Cl. 528-252.000.

Garber, Edward M., to Massachusetts Institute of Technology. Wide bandwidth withdrawal weighted surface acoustic wave filters. 4,600,852, Cl. 310-313.00B.

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Gardner, David: *See*—
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Garner, Henry C.: *See*—
Reynold, Timothy; Montgomery, Robert W.; Swaby, Harold; and Garner, Henry C., 4,601,042, Cl. 373-93.000.

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Brusasca, Gianfranco; and Garzulano, Franco, 4,599,960, Cl. 112-287.000.
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Bridges, Jack E.; Sutkowski, Robert J.; and Hofer, Kenneth E., Jr., 4,600,356, Cl. 414-694.000.
Hallen, Richard T.; and Sealock, L. John, Jr., 4,600,529, Cl. 252-373.000.

Gasner, John T., to Harris Corporation. Process of making twin well VLSI CMOS. 4,599,789, Cl. 29-571.000.

Gauthier, Francois H.: *See*—
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Brugger, Werner, 4,600,374, Cl. 425-149.000.

Geddes, Norman R., to Omark Industries, Inc. Railroad sleeper lock-in shoulder. 4,600,145, Cl. 238-351.000.

Gehl, Warren: *See*—
Wydeven, Robert M.; and Gehl, Warren, 4,600,420, Cl. 55-501.000.

Geiger, Friedrich, to Kleindienst GmbH. Method and equipment for mangling wet laundry. 4,599,814, Cl. 38-51.000.

Gelb, Herbert: *See*—
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Gelineau, Frederick D.; and Kinney, Thomas B., to Foxboro Company, The. Drying method and apparatus for fibrous material. 4,599,808, Cl. 34-27.000.

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Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,600,218, Cl. 285-50.000.

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Aycock, David F.; and Ting, Sai-Pei, 4,600,741, Cl. 524-139.000.
Cella, James A., 4,600,798, Cl. 568-636.000.
Hong, Jauwhei; Jens, Richard A.; Shen, Steve S.; and Manson, Earle L., Jr., 4,600,659, Cl. 428-471.000.
Olson, Daniel R., 4,600,640, Cl. 428-332.000.
Robertson, Brian T., 4,600,663, Cl. 428-632.000.
Santurtun, Carlos M.; and Carmena, Angel D., 4,601,051, Cl. 378-118.000.
Traver, Frank J.; Thimineur, Raymond J.; and Zotto, Anthony A., 4,600,436, Cl. 106-3.000.
Tupper, Leland C.; Walker, Loren H.; Weiss, Herbert W.; and Sember, James W., 4,600,874, Cl. 318-798.000.

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Pitchon, Esra; O'Rourke, Joseph D.; and Joseph, Theodore H., 4,600,472, Cl. 159-4.400.

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Kennedy, Richard A., 4,600,899, Cl. 331-116.00R.

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Georgiev, Vassil S.; and Kinsolving, Clyde R., to Pennwalt Corporation. Substituted spiro[oxazolidine-5,2'-adamantane] compounds. 4,600,782, Cl. 548-216.000.

Gerbe, Jean-Pierre: *See*—
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Gershenson, Edward; Lemone, Louis A.; and Faletra, Salvatore, to Data General Corporation. Apparatus for suspending a reserve operation in a disk drive. 4,600,990, Cl. 364-200.000.

Gerstein, Milton S.; and Kraft, Rosemarie R., to Kraft, Rosemarie R. Vehicular seat for handicapped and elderly persons. 4,600,239, Cl. 297-349.000.

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Rosenberg, Harry, 4,600,340, Cl. 405-297.000.
Temme, Helmut; and Wrobbel, Karl-Heinz, 4,600,097, Cl. 198-731.000.

GHA Lock Joint, Inc.: *See*—
Swanson, Harold V., 4,600,373, Cl. 425-144.000.

Ghebre-Sellassie, Isaac; Gordon, Robert H.; Harris, Michael R.; and Nesbitt, Russell U., Jr., to Warner-Lambert Company. Process for treating dosage forms. 4,600,645, Cl. 428-403.000.

Ghione, Roberto, to Hogar S.r.l. Machine for making espresso coffee, particularly for domestic use. 4,599,937, Cl. 99-293.000.

Gianluigi, Vittadini: *See*—
Garzia, Aldo, 4,600,725, Cl. 514-545.000.

Giannone, Charles: *See*—
Hinden, Milton; and Giannone, Charles, 4,600,345, Cl. 411-447.000.

Gibson, Arthur W.: *See*—
Scott, Gary C.; and Gibson, Arthur W., 4,600,108, Cl. 211-49.100.

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Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., 4,600,448, Cl. 148-407.000.

Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Anode for magnetic sputtering. 4,600,490, Cl. 204-298.000.

Gillman, Tommie D.; and McKimmy, Dirk E., to John Brown Inc. Differential pressure molding apparatus employing releasable restricted area molding clamp rings. 4,600,376, Cl. 425-346.000.

Gilman, Paul S.: *See*—
Donachie, Stephen J.; and Gilman, Paul S., 4,600,556, Cl. 420-542.000.

Gilman, Thomas, to Kendall Company, The. Combined wound dressing and delivery means composite. 4,600,001, Cl. 128-156.000.

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Heidner, Richard C.; Wetor, Clyde R.; and Fiedler, Bruce H., 4,600,075, Cl. 180-336.000.

Ginzburg, Vladimir B.; and Guo, Remn M., to Wean United, Inc. Tandem rolling mill. 4,599,883, Cl. 72-234.000.

Girone, Joseph M.; and Dolezal, F. Wesley, to Process Engineering Incorporated. Hydrostatic test apparatus. 4,599,890, Cl. 73-37.000.

GKN Automotive Components, Inc.: *See*—
Krude, Werner, 4,600,072, Cl. 180-73.300.

Glaxo Group Limited: *See*—
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,600,772, Cl. 544-625.000.

Gleason, Patricia A.; and Szymanski, Chester D., to National Starch and Chemical Corporation. Fluid loss control agents for drilling fluids containing divalent cations. 4,600,515, Cl. 252-8.50A.

Glynn, John R.; and Cobb, Lloyd A., to TRW Inc. Flat submersible electrical cable. 4,600,805, Cl. 174-102.00R.

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Huber, Guntram; Gmeiner, Gunter; and Krugener, Rolf, 4,600,237, Cl. 296-223.000.

Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, to Kulzer & Co. GmbH. Apparatus and method for applying a silicon oxide-containing adhesion-promoting layer on metallic dental prostheses. 4,600,390, Cl. 433-218.000.

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Goel, Anil B., to Ashland Oil, Inc. Reaction products of alkanol amines with bicyclic amide acetals and their application in polyurethane polymers. 4,600,796, Cl. 564-159.000.

Goetze AG: *See*—
Lonne, Klaus; Majewski, Klaus-Peter; and Zerfass, Hans-Rainer, 4,600,201, Cl. 277-1.000.

Goldberg, Newton N.; and Hudock, John S., to Westinghouse Electric Corp. Oil and dirt repellent alkyd paint. 4,600,441, Cl. 106-253.000.

Goldman, Abraham: *See*—
Quinn, Robert L.; Heyman, Philip M.; and Goldman, Abraham, 4,600,630, Cl. 428-203.000.

Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, to Andreas Stihl. Air-intake arrangement for a two-stroke engine. 4,600,418, Cl. 55-462.000.

Gongwer, Dean. Grease and liquid drainage member for a barbeque cooker. 4,599,938, Cl. 99-446.000.

Gongwer, Dean: *See*—
Gongwer, Nelson; and Gongwer, Dean, 4,600,596, Cl. 426-523.000.

Gongwer, Nelson; and Gongwer, Dean, to Nelgo Manufacturing Corporation. Automatic food cooking machine. 4,600,596, Cl. 426-523.000.

Gooda, Kazuhiro: *See*—
Fudatsuji, Toshiharu; Gooda, Kazuhiro; and Imazeki, Takao, 4,600,326, Cl. 400-691.000.

Goodall, Brian L.: *See*—
Chadwick, John C.; and Goodall, Brian L., 4,600,757, Cl. 526-142.000.

Goodford, Thomas W. Retractable seat cover for automotive vehicles. 4,600,238, Cl. 297-219.000.

Goodman, Steven. Assembly for utilizing bilge pump as power water jet. 4,599,753, Cl. 4-559.000.

Goodwin, Eugene L., to United States of America, Army. Metallographic preparation of particulate filled aluminum metal matrix composite material. 4,599,827, Cl. 51-326.000.

Gordon, Robert H.: *See*—
Ghebre-Sellassie, Isaac; Gordon, Robert H.; Harris, Michael R.; and Nesbitt, Russell U., Jr., 4,600,645, Cl. 428-403.000.

Goren, Sidney B.: *See*—
Cain, Gary L.; Honey, Elvin K.; and Goren, Sidney B., 4,600,997, Cl. 364-505.000.

Gorre, Luisa E.: *See*—
Pastor, Ricardo C.; and Gorre, Luisa E., 4,600,442, Cl. 134-2.000.

Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, to Jenoptik Jena GmbH. Apparatus and method for the automatic control of an aerial photographic camera. 4,600,283, Cl. 354-66.000.

Gosse, Marc; and Cheron, Jacques, to Legrand. Duct mounting fixture for securing a duct on a support. 4,600,174, Cl. 248-72.000.

Gosset, Serge: *See*—
Schneider, Jean; Gosset, Serge; and Lefer, Pierre, 4,600,439, Cl. 106-139.000.

Gould, William A. Garbage to hydrocarbon fuel conversion system. 4,599,953, Cl. 110-234.000.

Graf, Bernhard, to Fraunhofer-Gesellschaft z.Ford.der angew. Forschung. Manipulating device operating in two directions. 4,600,358, Cl. 414-749.000.

Grafe, Wolf-Rainer: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.

Graham, Martin H., to Rolm Corporation. Low power consuming AC to DC converter. 4,600,982, Cl. 363-61.000.

Graham, Neil A., to AE PLC. Method for reinforcement of pistons of aluminum or aluminum alloy. 4,599,772, Cl. 29-156.50R.

Graschew, Georgi: *See*—
Wyrwich, Helmut; Graschew, Georgi; Chatzipetros, Johann; and Feinendegen, Ludwig E., 4,599,800, Cl. 33-143.00C.

Grate, John H.; Hamm, David R.; and Valentine, Donald H., to Catalytica Associates; and Haldor Topsoe A/S. Process for the preparation of urethanes. 4,600,793, Cl. 560-25.000.

Grattidge, Alan E. T.: *See*—
Murphy, Arthur D.; and Grattidge, Alan E. T., 4,599,967, Cl. 118-72.000.

Gray, Charles E., to Harvey Hubbell Incorporated. Swivel coupling. 4,600,331, Cl. 403-165.000.

Gray, John M., Jr. Method and apparatus for joining stair rail fittings together. 4,600,044, Cl. 144-372.000.

Gray, Tommy L., to Span Instruments, Inc. Condition responsive apparatus. 4,599,902, Cl. 73-705.000.

Greco, Stephen E.; and Green, Dennis C., to International Business Machines Corp. Cross-linked polyalkenyl phenol based photoresist compositions. 4,600,683, Cl. 430-270.000.

Green, Dennis C.: *See*—
Greco, Stephen E.; and Green, Dennis C., 4,600,683, Cl. 430-270.000.

Green, Milton L. Livestock feed lot adaptation composition and method. 4,600,586, Cl. 426-2.000.

Greenman, Edwin G.: *See*—
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,600,404, Cl. 604-387.000.

Gregg, James R.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,599,884, Cl. 72-346.000.

Grellman, H. Erwin; Laakso, Carl W.; Reagan, John J.; and Roland, Leonard A., to Tektronix, Inc. Coplanar microstrap waveguide interconnector and method of interconnection. 4,600,907, Cl. 333-246.000.

Griffen, Neil C.; and Patoray, Stephen A., to Reliance Electric Company. Load cell apparatus. 4,600,066, Cl. 177-211.000.

Grigg, Ronald E.; and Amornraksa, Kitti. Smoking products comprising nicotine substitutes. 4,600,025, Cl. 131-335.000.

Grimm, Rolf: *See*—
Horn, Falk R.; Schmitt, Roland; Gurr, Manfred; and Grimm, Rolf, 4,600,623, Cl. 428-151.000.

Grohe, Bernd: *See*—
Zosi, Michael, 4,600,207, Cl. 280-279.000.

Groustra, Edward P.; and Roberts, Henry J., to Morton Thiokol, Inc. Out-of-line interrupter ignition system for flares and markers. 4,599,945, Cl. 102-256.000.

Grumet, Alex, to Grumman Aerospace Corporation. Automatic TV ranging system. 4,601,053, Cl. 382-1.000.

Grumman Aerospace Corporation: *See*—
Grumet, Alex, 4,601,053, Cl. 382-1.000.

Grund, J. Evan, to Nanometrics Incorporated. Method and apparatus for automatic optical focusing on an optically discernible feature on an object. 4,600,832, Cl. 250-201.000.

Grundei, Hans, to S+G Implants GmbH. Process for the production of an implant as a bone substitute. 4,600,546, Cl. 264-59.000.

Grundmann, Hans-Jorg: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.

Grynberg, Avigdor. User authorization verification apparatus for computer systems including a central device and a plurality of pocket sized remote units. 4,601,011, Cl. 364-900.000.

Grzeskowiak, John A., Jr.; and Hershkowitz, Elliott E., to AT&T Technologies, Inc. Detergent cleaning composition. 4,600,522, Cl. 252-170.000.

GTE Communication Systems Corp.: *See*—
Boeckmann, Eduard F. B., 4,600,876, Cl. 323-311.000.
Cellerino, Giuliano, 4,600,896, Cl. 331-11.000.

GTE Government Systems Corporation: *See*—
Guch, Steve, Jr., 4,601,038, Cl. 372-34.000.

GTE Laboratories Incorporated: *See*—
Baum, Peter N., 4,600,847, Cl. 307-491.000.
Norris, Peter E., 4,600,932, Cl. 357-22.000.

GTE Products Corporation: *See*—
Bouchard, Andre C.; Thibault, Paul A.; and Marcucci, Rudolph V., 4,600,856, Cl. 313-25.000.
Brower, Boyd G., 4,600,860, Cl. 315-73.000.
Sindlinger, Ronald E., 4,600,861, Cl. 315-73.000.

Guch, Steve, Jr., to GTE Government Systems Corporation. Conduction cooled solid state laser. 4,601,038, Cl. 372-34.000.

Guerin, Paul H.: *See*—
Ela, Roger B.; and Guerin, Paul H., 4,600,964, Cl. 361-144.000.

Guevarra, Alfredo L.; and Connelly, Fredrick J., to Flecto Company, Inc., The. Water wash-up coating composition. 4,600,440, Cl. 106-211.000.

Guha, Subhendu; and Kulman, James, to Sovonics Solar Systems. Fluorinated, p-doped microcrystalline silicon semiconductor alloy material. 4,600,801, Cl. 136-249.000.

Guichard, Francoise: *See—*
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.

Guidez, Joel: *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.

Guiglini, Jean-Yves M., to U.S. Philips Corporation. Invalidation arrangement for information stored in a memory during a certain period of time and radar comprising such an arrangement. 4,601,001, Cl. 364-518.000.

Guillen, Jose A. S.: *See—*
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., 4,600,703, Cl. 502-210.000.

Gulden, Walter: *See—*
Wester, Norbert; Uhl, Klaus; Gulden, Walter; and Schneider, Gerhart, 4,600,516, Cl. 252-8.55R.

Gulf & Western Manufacturing Company: *See—*
Ivan, Steve D., 4,600,352, Cl. 414-463.000.

Gullickson, Kathryn A. Decorative ear cuff. 4,599,874, Cl. 63-14.00R.

Gunderson, Inc.: *See—*
Hill, Charles C., 4,599,949, Cl. 105-355.000.

Gunther, Thomas A.: *See—*
Desilets, Brian H.; Gunther, Thomas A.; Hendricks, Charles J.; and Keller, John H., 4,600,464, Cl. 156-345.000.

Guo, Remn M.: *See—*
Ginzburg, Vladimir B.; and Guo, Remn M., 4,599,883, Cl. 72-234.000.

Gurr, Manfred: *See—*
Horn, Falk R.; Schmitt, Roland; Gurr, Manfred; and Grimm, Rolf, 4,600,623, Cl. 428-151.000.

Guthmueller, Rodney K.: *See—*
Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Guthmueller, Rodney K., 4,601,056, Cl. 382-50.000.

Guthrie, Roderick I. L.: *See—*
Doutre, Don A.; and Guthrie, Roderick I. L., 4,600,880, Cl. 324-71.100.

Gutierrez, Antonio; O'Halloran, Rosemary; and Brois, Stanley J., to Exxon Research & Engineering Co. Process for improving friction modification properties of a power transmission fluid with an alkylthio succinic acid or anhydride. 4,600,519, Cl. 252-48.600.

Gutzler, Marc H.: *See—*
Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., 4,600,069, Cl. 180-24.020.

Guy, Robert R., to Lof Plastics Inc. Method of extruding a foamed thermoplastic core and extruding and integrally sealing a non-porous skin thereon. 4,600,461, Cl. 156-244.120.

Guzman, Joe O. Writing pen with correction fluid reservoir. 4,600,327, Cl. 401-18.000.

Gynkotek Gesellschaft fur den Bau wissenschaftlich technischer Gerate m.b.H.: *See—*
Riggenmann, Hansjurgen, 4,600,365, Cl. 417-246.000.

Haaf, Arthur: *See—*
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, 4,600,778, Cl. 546-249.000.

Haan, Ted W.: *See—*
Suman, Michael J.; Van Order, Kim L.; Clark, Russell L.; and Haan, Ted W., 4,600,240, Cl. 297-408.000.

Habenschaden, Kurt: *See—*
Dost, Willibald; Habenschaden, Kurt; Kreutzer, Hans; and Wasner, Gunter, 4,600,272, Cl. 350-287.000.

Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Guthmueller, Rodney K., to Recognition Equipment Incorporated. Video correlator for video format unit. 4,601,056, Cl. 382-50.000.

Hackenberg, Willi, to Schubert & Salzer. Apparatus for guiding flexible supply lines. 4,600,817, Cl. 191-12.00C.

Hage, Charles T., to Eastman Kodak Company. Compact electrographic reproduction apparatus. 4,600,296, Cl. 355-16.000.

Hagemann, Hermann: *See—*
Meyer, Rolf-Volker; Dhein, Rolf; Brassat, Bert; and Hagemann, Hermann, 4,600,752, Cl. 525-424.000.

Hagemes, Dave: *See—*
Horton, James P.; Cebe, Jerry F.; Hagemes, Dave; and Jeter, Lewis M., 4,599,991, Cl. 126-345.000.

Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A. Element removal tool for system carrying fluid under pressure. 4,599,776, Cl. 29-213.00R.

Haid, Peter, to Inter-Ikea AG. Panel structure comprising boards and for instance serving as a floor or a panel. 4,599,841, Cl. 52-403.000.

Haken, Pieter T.; and Webb, Shirley B., to Shell Oil Company. Fungicidally active compositions containing ethene derivatives. 4,600,712, Cl. 514-188.000.

Hakuto Chemical Co., Ltd.: *See—*
Mizutani, Akihiko; Murayama, Hiroyoshi; Arakawa, Kohsaku; and Tanaka, Saburo, 4,600,513, Cl. 210-712.000.

Haldenwanger, Hans-Gunther: *See—*
Naumann, Fritz; and Haldenwanger, Hans-Gunther, 4,600,217, Cl. 280-808.000.

Haldor Topsoe A/S: *See—*
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,600,793, Cl. 560-25.000.

Hallen, Richard T.; and Sealock, L. John, Jr., to Gas Research Institute. Dehydrogenation of alcohols using alkali carbonate catalysts. 4,600,529, Cl. 252-373.000.

Hallerback, Stig, to Aktiebolaget SKF. Wheel-shaped objects. 4,600,400, Cl. 474-166.000.

Halliburton Company: *See—*
Borchardt, John K., 4,600,057, Cl. 166-295.000.
Eggleston, Joe E.; and Warren, David R., 4,600,059, Cl. 166-385.000.

Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr. System for transmitting data through a troposcatter medium. 4,601,046, Cl. 375-38.000.

Hama, Masaharu: *See—*
Fukumoto, Takaaki; Hama, Masaharu; and Kayano, Shinpei, 4,600,888, Cl. 324-439.000.

Hamilton Industries: *See—*
Pflieger, David C., 4,600,248, Cl. 312-195.000.

Hamm, David R.: *See—*
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,600,793, Cl. 560-25.000.

Hammerwerke Haspe Gebruder Kettler: *See—*
Temme, Helmut; and Wrobbel, Karl-Heinz, 4,600,097, Cl. 198-731.000.

Hand, Larry E.: *See—*
Taylor, Wilson E., Jr.; and Hand, Larry E., 4,600,891, Cl. 330-10.000.

Hans Dutina AB: *See—*
Dutina, Hans, 4,599,929, Cl. 83-821.000.

Hara, Akio, to Toyo Seikan Kaisha Ltd. Apparatus for determining the continuity of holes formed in a conductive sheet. 4,600,884, Cl. 324-236.000.

Hara, Kiyoaki; and Yokoyama, Issei, to Horiba, Ltd. Apparatus for measuring the luminous lifetime of a sample. 4,600,306, Cl. 356-317.000.

Harada, Masahiro: *See—*
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.

Harada, Mineo; Shimojo, Tetsuji; and Furuya, Kaname, to Hitachi, Ltd. Printing head assembly. 4,600,323, Cl. 400-124.000.

Harada, Toshimitsu: *See—*
Koizumi, Yukinori; and Harada, Toshimitsu, 4,600,949, Cl. 358-229.000.

Harder, Robert J.: *See—*
Aufdermarsh, Carl A.; Harder, Robert J.; and Spiegelman, Phillip P., 4,600,651, Cl. 428-422.000.

Harder, Wolfgang: *See—*
Bertleff, Werner; Muller, Franz-Josef; Kummer, Rudolf; and Harder, Wolfgang, 4,600,726, Cl. 518-701.000.

Harding, John W. Anticipatory thermostat with reset for domestic hydronic boiler control. 4,599,992, Cl. 126-351.000.

Hardt, Ivan E.; Bonebright, Cynthia A.; and Fuller, Ray C., to Rockwell International Corporation. Digital communications software control system. 4,601,043, Cl. 375-1.000.

Hardwick, Roy: *See—*
Sharp, William F.; Banker, John G.; and Hardwick, Roy, 4,600,332, Cl. 403-179.000.

Hargrave, Franklin; and Middleton, Francisco A., to ITT Corporation. Communication switching system. 4,601,029, Cl. 370-67.000.

Harlow, Albert L., Jr.; and Felske, Arthur M. Slidable tray insert for mailboxes. 4,600,143, Cl. 232-17.000.

Harmsen, Wayne A. Leggings. 4,599,812, Cl. 36-1.500.

Harris Corporation: *See—*
Gasner, John T., 4,599,789, Cl. 29-571.000.

Harris, Michael R.: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; Harris, Michael R.; and Nesbitt, Russell U., Jr., 4,600,645, Cl. 428-403.000.

Harris, Philip H., to Texas Industries, Inc. Co-production of cementitious products. 4,600,438, Cl. 106-100.000.

Hartley, Richard N.: *See—*
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.

Harvey, Donald M., to Eastman Kodak Company. Camera with film take-up spool. 4,600,286, Cl. 354-212.000.

Harvey, Frederick W., to Eastman Kodak Company. Overextended leader positioning mechanism. 4,600,285, Cl. 354-212.000.

Harvey Hubbell Incorporated: *See—*
Gray, Charles E., 4,600,331, Cl. 403-165.000.

Hashimoto, Takeshi: *See—*
Kogawa, Takashi; Teramoto, Kazuyoshi; and Hashimoto, Takeshi, 4,601,009, Cl. 364-900.000.

Hass, Werner; and Heemann, Volker, to B.A.T. Cigaretten Fabriken GmbH. Process for the preparation of aromatic substances from diterpene fractions. 4,600,023, Cl. 131-275.000.

Hassel, Tillmann; and Muller, Hanns P., to Bayer Aktiengesellschaft. Process for the preparation of acylated sugars with a glycosidically bonded isothiocyanate group. 4,600,771, Cl. 536-22.000.

Hata, Kotaro: *See—*
Nakamura, Eitaro; Hata, Kotaro; and Yamamoto, Makoto, 4,600,521, Cl. 252-62.540.

Hatanaka, Masahiko: *See*—
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.

Hatano, Hirofumi: *See*—
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.

Hatten, James L., to Texas Eastern Drilling Systems, Inc. Flexible drill pipe. 4,600,037, Cl. 138-120.000.

Hattori, Noboru: *See*—
Kitahara, Hisashi; Hattori, Noboru; Kato, Yoshiaki; and Hitomi, Nobuteru, 4,600,071, Cl. 180-53.800.

Haug, Paul E.: *See*—
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,601,046, Cl. 375-38.000.

Have, Serge: *See*—
Kafka, Bernard; Meunier, Jean-Paul; and Have, Serge, 4,600,637, Cl. 428-318.400.

Hawker, Fred D.: *See*—
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,599,807, Cl. 34-9.000.

Hayashi, Hiroaki: *See*—
Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, 4,600,437, Cl. 106-74.000.

Hayashi, Ikuo; Idogaki, Takaharu; and Kawai, Hisasi, to Nippon Soken, Inc. Motor speed controlling device. 4,600,867, Cl. 318-341.000.

Hayashi, Ikuo: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; and Kawai, Hisasi, 4,600,871, Cl. 318-653.000.

Hayashi, Mishio, to Takeda Riken Kogyo Kabushikikaisha. Phase difference measuring apparatus. 4,600,994, Cl. 364-484.000.

Hayashi, Takao; Arai, Masanobu; and Shinozuka, Takashi, to NEC Corporation. Subscriber line interface circuit. 4,600,811, Cl. 179-16.0AA.

Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, to Kabushiki Kaisha Nipponcoinco. Automatic vending machine with rotational dispensing function. 4,600,094, Cl. 194-217.000.

Hazenlite Incorporated: *See*—
MacIntyre, Hazen L., 4,600,972, Cl. 362-20.000.

Heath Company: *See*—
Coules, Russell G., 4,600,357, Cl. 414-730.000.

Hebert, Theodore M.; and Hebert, Thomas H. Thermosyphon heat recovery. 4,599,870, Cl. 62-238.600.

Hebert, Thomas H.: *See*—
Hebert, Theodore M.; and Hebert, Thomas H., 4,599,870, Cl. 62-238.600.

Hechtl, Wolfgang: *See*—
Louis, Eckhart; Hechtl, Wolfgang; and Hefner, Heinz, 4,600,731, Cl. 523-109.000.

Hedin, Raymond C.; Meddaugh, Samuel A.; and Torok, Ernest J., to United States of America, Air Force. Beam recombination via cylindrical mirror. 4,600,270, Cl. 350-162.170.

Heemann, Volker: *See*—
Hass, Werner; and Heemann, Volker, 4,600,023, Cl. 131-275.000.

Hefner, Heinz: *See*—
Louis, Eckhart; Hechtl, Wolfgang; and Hefner, Heinz, 4,600,731, Cl. 523-109.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Thermosettable resin composition containing alkenyl phenyl cyanate. 4,600,760, Cl. 526-262.000.

Heidner, Richard C.; Wetor, Clyde R.; and Fiedler, Bruce H., to Gilson Brothers Company. Transmission neutral return for lawn and garden vehicles. 4,600,075, Cl. 180-336.000.

Heimerich, Henry R.: *See*—
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.

Hein, Lehmann AG: *See*—
Hoppe, Kurt, 4,600,506, Cl. 209-310.000.

Heisler, Jerome S., to Container Corporation of America. Method of making a composite container. 4,599,782, Cl. 29-428.000.

Held, Kurt. Continuously operating press for pressing an advancing web of material. 4,599,940, Cl. 100-154.000.

Hendel, Philip M. Guided osteotome for harvesting cranial bone graft. 4,600,005, Cl. 128-304.000.

Henderson, Ann: *See*—
James, James R.; Johnson, Reginald H.; Henderson, Ann; and Ponting, Mary H., 4,600,018, Cl. 128-804.000.

Henderson, Harry E.: *See*—
Butler, Kevin D.; and Henderson, Harry E., 4,600,502, Cl. 208-284.000.

Hendricks, Charles J.: *See*—
Desilets, Brian H.; Gunther, Thomas A.; Hendricks, Charles J.; and Keller, John H., 4,600,464, Cl. 156-345.000.

Hendrickson, Max S. Protective apparatus for encapsulating electrical circuits. 4,600,969, Cl. 361-395.000.

Hendrickson, William A.; Evans, Jack L.; Paulson, Kenneth R.; and Wilson, Robert W., to Minnesota Mining and Manufacturing Company. Silicone release coatings for efficient toner transfer. 4,600,673, Cl. 430-66.000.

Henein, Nabil: *See*—
Klostermann, Gerd; and Henein, Nabil, 4,599,924, Cl. 83-50.000.

Henes, Gerhard: *See*—
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, 4,600,753, Cl. 525-439.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Opitz, Reinhard; Hosemann, Kurt; and Portz, Heinz, 4,600,447, Cl. 148-6.15R.
Piorr, Robert; Schluessler, Hans-Joachim; and Nikolaus, Peter, 4,600,523, Cl. 252-174.220.

Hepworth, Malcolm T.; and Wicker, Gordon R., to AMAX Inc. Coal slagging burner for producing clean low-sulfur fuel gas. 4,599,955, Cl. 110-347.000.

Herberts Gesellschaft mit beschraenkter Haftung: *See*—
Patzschke, Hans-Peter; Goebel, Armin; and Klein, Klausjorg, 4,600,485, Cl. 204-181.700.

Hergeth Hollingsworth GmbH: *See*—
Wirth, Walter, 4,599,766, Cl. 19-106.00R.

Herman, Michael: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,600,141, Cl. 229-92.700.

Hermann, Hans D.; Fock, Kurt; Fabian, Klaus; and Ebigt, Joachim, to Hoechst Aktiengesellschaft. Plasticized thermoplastic polyvinylbutyral molding compositions having reduced adhesion to glass. 4,600,655, Cl. 428-437.000.

Heron, Roger A.: *See*—
Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., 4,599,893, Cl. 73-61.00R.

Herrmann, Heinz. Device for bending the margins of a metal foil over the edge of a flat glass article. 4,599,882, Cl. 72-211.000.

Herrmann, Heinz. Hand roller for the application of metal foils to the edges of flat glass articles. 4,600,466, Cl. 156-391.000.

Hershkowitz, Elliott E.: *See*—
Grzeskowiak, John A., Jr.; and Hershkowitz, Elliott E., 4,600,522, Cl. 252-170.000.

Hertrich, Wolfgang; and Fritsch, Volker, to Euchner & Co. Circuit arrangement to protect a semi-conductor switch which can be activated without contact (remotely). 4,600,963, Cl. 361-101.000.

Hettiger, James, to RCA Corporation. Tracking image frequency trap. 4,601,062, Cl. 455-285.000.

Hettinger, William P., Jr., to Ashland Oil, Inc. Combination process for upgrading reduced crude. 4,600,499, Cl. 208-113.000.

Heyden, Dennis J.: *See*—
Raymer, Doyle; Eveland, Michael; and Heyden, Dennis J., 4,600,148, Cl. 239-29.300.

Heyl, Robert D., to Young Industries, Incorporated, The. Rotary shaft seal assembly. 4,600,032, Cl. 137-315.000.

Heyman, Philip M.: *See*—
Quinn, Robert L.; Heyman, Philip M.; and Goldman, Abraham, 4,600,630, Cl. 428-203.000.

Heymer, Gero: *See*—
Lehr, Klaus; Hofmann, Bernhard; and Heymer, Gero, 4,600,565, Cl. 423-50.000.

Hiatt, Michael H., to United States of America, Administrator Environmental Protection Agency. Vacuum extractor with cryogenic concentration and capillary interface. 4,600,559, Cl. 422-89.000.

Hicks, Irwin A.; and Schroeck, Joseph P., to American Meter Company. Remote meter display unit. 4,600,923, Cl. 340-870.020.

Hidle, Jerry, to Panhandle Industries, Inc. Paper towel insert and dispenser. 4,600,162, Cl. 242-55.200.

Hiejima, Kiyoshi, to Sanyo Electric Co., Ltd. Induction heating apparatus having adjustable heat output. 4,600,823, Cl. 219-10.770.

Higashi, Takehiro; Kobori, Michio; Yoshino, Zenichi; and Morimoto, Seiichi, to Sanwa Shoji Co., Ltd. Method of processing fermented liquid. 4,600,477, Cl. 203-26.000.

Higgins, William A., to Lubrizol Corporation, The. Polycarbonate compositions. 4,600,742, Cl. 524-166.000.

Hightower, James O., Jr.: *See*—
Junior, Kenneth E.; Byrd, James D.; and Hightower, James O., Jr., 4,600,732, Cl. 523-138.000.

Higuchi, Tadashi: *See*—
Yamano, Shoji; Mikata, Yoshitaka; Higuchi, Tadashi; and Nishide, Kazuhiro, 4,600,096, Cl. 198-505.000.

Higuchi, Tomitake: *See*—
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,600,572, Cl. 423-447.200.

Hill, Charles C., to Gunderson, Inc. Light weight container car. 4,599,949, Cl. 105-355.000.

Hill, Loren G. Method and apparatus for selecting fishing lure color. 4,599,820, Cl. 43-4.500.

Hill, William H., to Hughes Aircraft Company. Bonding tool and clamp assembly and wire handling method. 4,600,138, Cl. 228-179.000.

Hilliard, William G.: *See*—
Krumwiede, John F.; Hilliard, William G.; and Sims, Roy M., 4,600,425, Cl. 65-178.000.

Hinden, Milton; and Giannone, Charles, to Duro-Dyne Corporation. Impact fastener device. 4,600,345, Cl. 411-447.000.

Hinn, Werner, to RCA Corporation. Kinescope bias sensing circuit. 4,600,950, Cl. 358-243.000.

Hiraga, Masaharu: *See*—
Terauchi, Kiyoshi; Kubo, Yasuhiro; and Hiraga, Masaharu, 4,600,367, Cl. 417-360.000.

Hiramatsu, Kenichi: *See*—
Kizu, Shuji; Ishida, Tsuyoshi; Hiramatsu, Kenichi; and Miura, Junji, 4,600,843, Cl. 250-578.000.

Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, to Toray Industries, Inc. Ultrahigh strength carbon fibers. 4,600,572, Cl. 423-447.200.

Hirano, Mitsunori: *See—*
Nakamura, Taku; Hirano, Mitsunori; Ogawa, Masasi; and Ishigaki, Kunio, 4,600,687, Cl. 430-529.000.

Hirata, Yoshiaki: *See—*
Kaneko, Shigeru; Hirata, Yoshiaki; and Nohara, Yoshio, 4,600,370, Cl. 425-38.000.

Hirata, Yutaka: *See—*
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, 4,600,047, Cl. 164-453.000.

Hirosawa, Koichiro, to Aisin Seiki Kabushiki Kaisha. Continuously variable transmission including planetary gearing. 4,599,916, Cl. 74-689.000.

Hirose, Satoru: *See—*
Nozawa, Ryoichiro; Kawamura, Hideaki; Sasaki, Takao; and Hirose, Satoru, 4,600,985, Cl. 364-169.000.

Hirota, Takao; and Ishizaki, Yoichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Static expansive demolition agent in the three-dimensional form and process for demolishing brittle material using the same. 4,600,154, Cl. 241-1.000.

Hirota, Yoji: *See—*
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.

Hirschfeld, Tomas B., to University of California. Pressure-sensitive optrode. 4,599,901, Cl. 73-705.000.

Hitachi Keiyo Engineering Co., Ltd.: *See—*
Kogawa, Takashi; Teramoto, Kazuyoshi; and Hashimoto, Takeshi, 4,601,009, Cl. 364-900.000.

Hitachi, Ltd.: *See—*
Furuhata, Takashi; Nakama, Taihei; and Masuda, Yoshinori, 4,600,953, Cl. 360-10.300.
Harada, Mineo; Shimojo, Tetsuji; and Furuya, Kaname, 4,600,323, Cl. 400-124.000.
Ichihashi, Mikio; Fukuhara, Satoru; Okumura, Masahide; and Murakoshi, Hisaya, 4,600,839, Cl. 250-310.000.
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.
Imura, Ryo; Sugita, Yutaka; and Kumasaka, Noriyuki, 4,600,488, Cl. 204-192.00N.
Kogawa, Takashi; Teramoto, Kazuyoshi; and Hashimoto, Takeshi, 4,601,009, Cl. 364-900.000.
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Momata, Kazuhiro; and Arai, Shinichi, 4,600,965, Cl. 361-153.000.
Sugiura, Noboru, 4,599,982, Cl. 123-425.000.
Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, 4,601,013, Cl. 365-36.000.

Hitachi Metals, Ltd.: *See—*
Shimizu, Motoharu, 4,600,555, Cl. 419-5.000.

Hitco: *See—*
Spain, Raymond G.; and Massie, James E., 4,600,457, Cl. 156-158.000.

Hite, Jerry R.: *See—*
Frank, Peter J.; and Hite, Jerry R., 4,600,795, Cl. 562-599.000.

Hitomi, Hisakazu: *See—*
Koga, Takashi; and Hitomi, Hisakazu, 4,600,897, Cl. 331-113.00R.

Hitomi, Nobuteru: *See—*
Kitahara, Hisashi; Hattori, Noboru; Kato, Yoshiaki; and Hitomi, Nobuteru, 4,600,071, Cl. 180-53.800.

Hlavac, Harry F.; and Koski, Erik B., to Hlavac, Harry F. Adjustable pedal. 4,599,915, Cl. 74-594.400.

Hobart Corporation: *See—*
Fritzsche, Donald E.; Panora, Robert A.; and Bangert, Matthew D., 4,599,990, Cl. 126-351.000.

Hodgson, Edward W. Orthodontic bracket remover. 4,600,381, Cl. 433-4.000.

Hoechst AG: *See—*
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Hoechst Aktiengesellschaft: *See—*
Hermann, Hans D.; Fock, Kurt; Fabian, Klaus; and Ebigt, Joachim, 4,600,655, Cl. 428-437.000.
Huber, Bernd, 4,600,407, Cl. 8-115.540.
Lehr, Klaus; Hofmann, Bernhard; and Heymer, Gero, 4,600,565, Cl. 423-50.000.
Mohr, Dieter, 4,600,482, Cl. 204-129.400.
Toth, Tibor, 4,600,698, Cl. 436-534.000.
Wester, Norbert; Uhl, Klaus; Gulden, Walter; and Schneider, Gerhart, 4,600,516, Cl. 252-8.55R.

Hofer, Kenneth E., Jr.: *See—*
Bridges, Jack E.; Sutkowski, Robert J.; and Hofer, Kenneth E., Jr., 4,600,356, Cl. 414-694.000.

Hoffend, Thomas R.; and Mammino, Joseph, to Xerox Corporation. Organoalkoxysilane carrier coatings. 4,600,677, Cl. 430-108.000.

Hofmann, Bernhard: *See—*
Lehr, Klaus; Hofmann, Bernhard; and Heymer, Gero, 4,600,565, Cl. 423-50.000.

Hogan, Robert J.: *See—*
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Howell, Jerald A., 4,600,504, Cl. 208-251.00H.

Hogar S.r.l.: *See—*
Ghione, Roberto, 4,599,937, Cl. 99-293.000.

Holbrow, Frederick W.: *See—*
Kenney, Thomas A.; and Holbrow, Frederick W., 4,599,964, Cl. 114-124.000.

Hollis Automation, Inc.: *See—*
Comerford, Matthias F., 4,600,137, Cl. 228-102.000.

Holt, Ronald R.; Joseph, William A.; and Zeissler, Edward J., to National Controls Corporation. Microcomputer controlled cooking timer and method. 4,601,004, Cl. 364-557.000.

Holtrop, James S.: *See—*
Maurer, Richard P.; and Holtrop, James S., 4,600,621, Cl. 428-121.000.

Holzmann, Hermann. Cable screw joint. 4,600,803, Cl. 174-65.0SS.

Honda Giken Kogyo K.K.: *See—*
Morishima, Kazuo, 4,600,208, Cl. 280-289.00A.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Watanabe, Masaki; Yagasaki, Akio; and Kawashima, Yoshinori, 4,600,074, Cl. 180-251.000.

Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, to Bridgstone Corporation. Sandwich glasses. 4,600,627, Cl. 428-203.000.

Honett, Ronald G. K. Engine-driven platform for sports, entertainment and similar purposes. 4,600,073, Cl. 180-181.000.

Honey, Elvin K.: *See—*
Cain, Gary L.; Honey, Elvin K.; and Goren, Sidney B., 4,600,997, Cl. 364-505.000.

Honeywell Inc.: *See—*
Egli, Werner H.; and Lenz, James E., 4,600,883, Cl. 324-207.000.
Faxvog, Frederick R.; and Mocker, Hans W., 4,601,036, Cl. 372-20.000.
Fusco, Albert J.; and Cochran, Bruce C., 4,600,469, Cl. 156-636.000.
Roberts, Peter C., 4,601,016, Cl. 365-175.000.

Honeywell Information Systems Inc.: *See—*
Boudreau, Daniel A.; and Salas, Edward R., 4,600,992, Cl. 364-200.000.

Hong, Jauwhei; Jens, Richard A.; Shen, Steve S.; and Manson, Earle L., Jr., to General Electric Company. Emissive coating on alloy x-ray tube target. 4,600,659, Cl. 428-471.000.

Honsho, Norihisa; and Mori, Kazuhiro, to Matsushita Electric Industrial Co., Ltd. Injection apparatus including means for feeding solid resin to an injection means and radiant heating means to melt the resin. 4,600,375, Cl. 425-174.400.

Hoovler, Thomas H.; and Vertino, Antonina. Printer for producing both braille characters and printed characters. 4,600,320, Cl. 400-122.000.

Hoppe, Kurt, to Hein, Lehmann AG. Screening machine and method. 4,600,506, Cl. 209-310.000.

Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, to Beiersdorf AG; and Hoechst AG. O/W Emulsifiers for cosmetic purposes. 4,600,539, Cl. 260-410.700.

Hoppner, Klaus: *See—*
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Horiba, Ltd.: *See—*
Hara, Kiyoaki; and Yokoyama, Issei, 4,600,306, Cl. 356-317.000.

Horii, Mitsumasa: *See—*
Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, 4,600,437, Cl. 106-74.000.

Horn, Falk R.; Schmitt, Roland; Gurr, Manfred; and Grimm, Rolf, to Carl Freudenberg, Firma. Padded material. 4,600,623, Cl. 428-151.000.

Horn, Gerald: *See—*
Lopez, Osvaldo; and Horn, Gerald, 4,600,004, Cl. 128-303.00R.

Horna, Otakar A., to Communications Satellite Corporation. Automatic gain control for echo cancellers and similar adaptive systems. 4,600,815, Cl. 179-170.200.

Horodysky, Andrew G., to Mobil Oil Corporation. Borated adducts of diamines and alkoxides as multifunctional lubricant additives and compositions thereof. 4,600,520, Cl. 252-49.600.

Horodysky, Andrew G.: *See—*
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,600,517, Cl. 252-32.70E.

Horr, Robert A.; and Mohler, Rick L., to International Business Machines Corporation. Process for making self aligned field isolation regions in a semiconductor substrate. 4,600,445, Cl. 148-1.500.

Horstmann, Harald: *See—*
Samaan, Samir; and Horstmann, Harald, 4,600,783, Cl. 548-501.000.

Horton, James P.; Cebe, Jerry F.; Hagemes, Dave; and Jeter, Lewis M., to Miller Brewing Company. Door for brew kettle. 4,599,991, Cl. 126-345.000.

Horvat, Philippe, to U.S. Philips Corporation. Demodulator comprising a phase-locked loop. 4,600,890, Cl. 329-122.000.

Horwitz, Lawrence B.; and Wiggins, Eugene T., to Sangamo Weston, Inc. Code division multiplexer using direct sequence spread spectrum signal processing. 4,601,047, Cl. 375-2.200.

Hosaka, Akihiko; Okuyama, Kiyotaka; and Kanazawa, Kiyoto, to TDK Corporation. Magnetic recording medium. 4,600,650, Cl. 428-413.000.

Hosemann, Kurt: *See—*
Opitz, Reinhard; Hosemann, Kurt; and Portz, Heinz, 4,600,447, Cl. 148-6.15R.

Hosokawa, Kanji: *See—*
Nakai, Kiyoto; and Hosokawa, Kanji, 4,600,605, Cl. 427-379.000.

Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and device for automatically developing photosensitive material. 4,600,287, Cl. 354-299.000.

Hoube, Allen G.: *See—*
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., 4,599,784, Cl. 29-450.000.
Houck, Willie G.; Newsome, Reginald W.; Nichols, Walter A.; and Thesing, Richard A., to Philip Morris Incorporated. Cigarette and method of making it. 4,600,027, Cl. 131-336.000.
Hovland, Lyle W.; and Klingensmith, James D., to Aluminum Company of America. Method for installing a mounting structure on the exterior of a building. 4,599,785, Cl. 29-526.00R.
Howard, Peter, to Raychem Corporation. Crimp connector having gel between envelope and crimp body. 4,600,804, Cl. 174-84.00C.
Howell, Jerald A.: *See—*
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Howell, Jerald A., 4,600,504, Cl. 208-251.00H.
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, to Nukem GmbH. Molded body for embedding radioactive waste and process for its production. 4,600,610, Cl. 428-2.000.
Hsei, Paul: *See—*
Liston, Max D.; Braig, James R.; Blackburn, Wayne; and Hsei, Paul, 4,600,412, Cl. 55-189.000.
Hu, Andrew. Security socket. 4,600,258, Cl. 339-40.000.
Huber, Bernd, to Hoechst Aktiengesellschaft. Process for the production of swellable filaments, fibers and shaped structures of acrylic polymers, and the products obtained thereby. 4,600,407, Cl. 8-115.540.
Huber, Guntram; Gmeiner, Gunter; and Krugener, Rolf, to Daimler-Benz Aktiengesellschaft. Switch for a sliding-lifting-roof of a motor vehicle. 4,600,237, Cl. 296-223.000.
Hubred, Gale L.; and Dubrovsky, Michael, to Chevron Research Company. Electrolytic reduction of cobaltic ammine. 4,600,483, Cl. 204-130.000.
Hudock, John S.: *See—*
Goldberg, Newton N.; and Hudock, John S., 4,600,441, Cl. 106-253.000.
Hudson, Harry R.: *See—*
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, 4,600,429, Cl. 71-86.000.
Hudson, Michael J.; and Sinclair, John C., to Permanent Way Equipment Company Limited, The. Bending and straightening apparatus. 4,599,878, Cl. 72-19.000.
Huebner, Hans F. Method of treating weight loss disorders. 4,600,718, Cl. 514-282.000.
Huesken, Kay: *See—*
Coombes, Robert L.; and Huesken, Kay, 4,600,480, Cl. 204-20.000.
Huet, Jacques, to Commissariat a l'Energie Atomique. System for the non-destructive testing of the internal structure of objects. 4,600,998, Cl. 364-507.000.
Huffman, Charles E.; and Pepmiller, Paul E., to Rockwell International Corporation. Method of and apparatus for checking datapath failure in a communication muldem. 4,601,028, Cl. 370-15.000.
Hufton, Arthur; and Gardner, David, to Teledyne Industries, Inc. Air bubble detector device. 4,599,888, Cl. 73-19.000.
Hughes Aircraft Company: *See—*
Hill, William H., 4,600,138, Cl. 228-179.000.
Koster, William G.; and Byrne, Allan B., 4,600,169, Cl. 244-118.100.
Pastor, Ricardo C.; and Gorre, Luisa E., 4,600,442, Cl. 134-2.000.
Wagner, Gene A.; and Newberg, Irwin L., 4,600,892, Cl. 330-144.000.
Hughes, Martin L.: *See—*
Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., 4,599,893, Cl. 73-61.00R.
Hughes Tool Company: *See—*
Scales, Stanley R.; Shotwell, Duane E.; and Atkinson, Gerald O., 4,600,064, Cl. 175-368.000.
Van Wormer, Richard A.; Baugh, John L.; Ledet, Charles; and Roach, Malcolm, 4,600,058, Cl. 166-382.000.
Huitema, Thomas W.: *See—*
Mueller, George R.; and Huitema, Thomas W., 4,600,966, Cl. 361-166.000.
Hummel, John E.; and Baab, William E., to Linear Films, Inc. Apparatus for controlled manual unrolling of rolled flexible material. 4,600,163, Cl. 242-96.000.
Humphries, Jim: *See—*
Miller, Jim; Humphries, Jim; and Teel, Toby, 4,600,054, Cl. 166-75.100.
Hunter, James J. Weighted golf club handle. 4,600,195, Cl. 273-81.00A.
Hunter, Joe S., to United States of America, Army. Tubular shaped sled test complex. 4,599,897, Cl. 73-432.00R.
Hurst, Kurt; Neuffer, Kurt; and Reinhart, Karl-Franz, to Robert Bosch GmbH. Thin-film multitrack magnetic head of high track density. 4,600,958, Cl. 360-123.000.
Huruhata, Shooichi: *See—*
Sekiya, Tsuneto; Matsuura, Osamu; and Huruhata, Shooichi, 4,600,968, Cl. 361-394.000.
Huschka, Hans: *See—*
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, 4,600,610, Cl. 428-2.000.
Huser, Diane L.; Schaus, John M.; Titus, Robert D.; and Weigel, Leland O., to Eli Lilly and Company. Method of preparing 1-alkyl-7-oxodecahydroquinolines, and cis(±) and tran(±)isomers so prepared. 4,600,777, Cl. 546-164.000.
Hutchings, David A.: *See—*
Lee, David M.; Hutchings, David A.; Sieloff, Gloria M.; and Willard, G. Fred, 4,600,765, Cl. 528-193.000.
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., to Shering Aktiengesellschaft. Benzodiazepine antagonistic β-carboline derivatives and compositions thereof. 4,600,715, Cl. 514-222.000.
Hutley, Michael C., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus to focus light on a surface based on color. 4,600,831, Cl. 250-201.000.
Hwa, Chih M.: *See—*
Cuisia, Dionisio G.; and Hwa, Chih M., 4,600,524, Cl. 252-181.000.
Hyde, Robert E. Apparatus for maximizing refrigeration capacity. 4,599,873, Cl. 62-498.000.
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, to Ashimori Industry Co., Ltd. Tubular lining material and a method and apparatus for manufacturing same. 4,600,615, Cl. 428-36.000.
Ichihashi, Mikio; Fukuhara, Satoru; Okumura, Masahide; and Murakoshi, Hisaya, to Hitachi, Ltd. Small-dimension measurement system by scanning electron beam. 4,600,839, Cl. 250-310.000.
ICI Americas Inc.: *See—*
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,600,740, Cl. 524-120.000.
Ide, Yukio: *See—*
Fujimura, Itaru; Ide, Yukio; Kageyama, Yoshiyuki; and Kunita, Masako, 4,600,672, Cl. 430-64.000.
Idogaki, Takaharu; Hayashi, Ikuo; and Kawai, Hisasi, to Nippon Soken, Inc. Multi-directional drive type electromagnetic position control apparatus. 4,600,871, Cl. 318-653.000.
Idogaki, Takaharu: *See—*
Hayashi, Ikuo; Idogaki, Takaharu; and Kawai, Hisasi, 4,600,867, Cl. 318-341.000.
Igata, Kouichi; Deguchi, Yoshihiro; and Kobayashi, Masaaki, to Matsushita Electric Industrial Co., Ltd. Helical scan video tape recorder with auxiliary heads for blur free high speed reproduction pictures. 4,600,952, Cl. 360-10.300.
Ihas, Gary G.; and Berg, Robert F., to University of Florida. Cryogenic current lead and method. 4,600,802, Cl. 174-15.0CA.
Iida, Takeo: *See—*
Taki, Hisao; and Iida, Takeo, 4,600,460, Cl. 156-235.000.
Iida, Yasumasa: *See—*
Yamasaki, Shinji; Sugiyama, Yoshiki; Tangiku, Itsurou; and Iida, Yasumasa, 4,600,086, Cl. 187-27.000.
Iizuka, Kazuo, to Canon Kabushiki Kaisha. Projection system capable of effecting precise focus adjustment. 4,600,275, Cl. 350-418.000.
Ikeda, Teppei: *See—*
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,600,641, Cl. 428-355.000.
Ikeda, Yoshikazu: *See—*
Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, 4,600,851, Cl. 310-324.000.
Ikegami Tsushinki Co., Ltd.: *See—*
Oka, Masaya; and Nakagawa, Sumio, 4,600,200, Cl. 273-313.000.
Il Kwang Co., Ltd.: *See—*
Ko, Sung H., 4,600,034, Cl. 137-554.000.
Illinois Tool Works Inc.: *See—*
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,600,662, Cl. 428-624.000.
Doyle, Beryle S.; and Peek, Brian R., 4,599,768, Cl. 24-590.000.
Sutenbach, Paul M.; Peek, Brian R.; and Daubert, Richard F., 4,600,344, Cl. 411-435.000.
Imai, Koji: *See—*
Sakai, Takami; and Imai, Koji, 4,600,981, Cl. 363-35.000.
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, to Mitsubishi Chemical Industries; and Hitachi Ltd. Liquid crystal composition. 4,600,527, Cl. 252-299.100.
Imazeki, Takao: *See—*
Fudatsuji, Toshiharu; Gooda, Kazuhiro; and Imazeki, Takao, 4,600,326, Cl. 400-691.000.
Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte: *See—*
Lindner, Adolf; and Linnau, Yendra, 4,600,574, Cl. 424-28.000.
Imperial Chemical Industries PLC: *See—*
Cramp, John H. W.; and Reid, Robert F., 4,600,310, Cl. 356-432.000.
Jennings, James R., 4,600,704, Cl. 502-318.000.
Imura, Ryo; Sugita, Yutaka; and Kumasaka, Noriyuki, to Hitachi, Ltd. Control method of magnetic anisotropy and device utilizing the control method. 4,600,488, Cl. 204-192.00N.
INA Walzlager Schaeffler KG: *See—*
Rohrig, Harald; and Rudolf, Gunther, 4,600,333, Cl. 403-259.000.
Inaba, Masafumi: *See—*
Nogami, Masaru; Inaba, Masafumi; and Oki, Yoshitaka, 4,600,828, Cl. 235-379.000.
Inaba, Yoshihiro: *See—*
Ishii, Fumio; and Inaba, Yoshihiro, 4,600,628, Cl. 428-216.000.
Inano, Mitsumasa; and Okane, Masaaki, to Murata Manufacturing Co., Ltd. Tape-mounted electronic components assembly. 4,600,116, Cl. 206-330.000.
Incecik, Zafer: *See—*
Wilhelm, Wilhelm; and Incecik, Zafer, 4,601,049, Cl. 377-115.000.
Inco Alloys International, Inc.: *See—*
Donachie, Stephen J.; and Gilman, Paul S., 4,600,556, Cl. 420-542.000.
Indelicato, Joseph M.: *See—*
Engel, Gary L.; Indelicato, Joseph M.; and Rose, Harry A., 4,600,773, Cl. 544-30.000.

Indesit Industria Elettrodomestici Italiana SpA: *See*—
Belisomi, Pietro; and Farina, Attilio, 4,600,918, Cl. 340-711.000.

Industrial Manufacturers of Orosi: *See*—
Morris, Billy J., 4,600,065, Cl. 177-123.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Cosentino, Giuseppe; and Provera, Franco, 4,600,808, Cl. 179-2.0DP.

Ingvarsson, Lars, to Dobel AB. Vehicle safety bar. 4,599,843, Cl. 52-729.000.

Ingvarsson, Lars I.; and Ramsden, Jonathan A., to Dobel AB and Stalbyggnadsinstitutet. Cassette for casting of framework. 4,599,840, Cl. 52-340.000.

Inmont Corporation: *See*—
Georgalas, Nick; Pucknat, John G.; and Villano, Ralph R., 4,600,737, Cl. 523-414.000.

Inmos Limited: *See*—
Walker, Christopher P. H.; and Wilson, Peter J., 4,601,031, Cl. 371-10.000.

Inoue Seisakusho (Mfg.) Co., Ltd.: *See*—
Moroo, Akira; Tokunaga, Yoshiyasu; Suzuki, Takashi; and Yoshioka, Tadahiko, 4,600,313, Cl. 366-313.000.

Institut Sverkhtverdykh Materialov Akademii Naukukrainskoi SSR: *See*—
Podoprigora, Georgy A., 4,599,826, Cl. 51-71.000.

Integrated Automation, Limited: *See*—
Bok, Edward, 4,600,471, Cl. 156-646.000.

Inter-Ikea AG: *See*—
Haid, Peter, 4,599,841, Cl. 52-403.000.

Interlock Technologies Corporation: *See*—
Blose, Thomas L., 4,600,224, Cl. 285-334.000.
Blose, Thomas L., 4,600,225, Cl. 285-334.000.

InterMetro Industries Corp.: *See*—
Sickles, Willard J., 4,600,231, Cl. 294-161.000.

International Business Machines Corporation: *See*—
Aiken, John A., Jr., 4,601,012, Cl. 364-900.000.
Bednorz, Johannes G.; Lanz, Martin A.; Nievergelt, Hermann; and Pohl, Wolfgang D., 4,600,854, Cl. 310-331.000.
Cade, Paul E.; El-Kareh, Badih; and Kim, Ick W., 4,599,792, Cl. 29-576.00W.
Croisier, Alain, 4,601,030, Cl. 370-88.000.
Desilets, Brian H.; Gunther, Thomas A.; Hendricks, Charles J.; and Keller, John H., 4,600,464, Cl. 156-345.000.
DiStefano, Thomas H.; and Johnson, Mark, 4,600,837, Cl. 250-235.000.
Greco, Stephen E.; and Green, Dennis C., 4,600,683, Cl. 430-270.000.
Horr, Robert A.; and Mohler, Rick L., 4,600,445, Cl. 148-1.500.
Joseph, Robert R.; and Wong, Man-Chong, 4,600,624, Cl. 428-161.000.
Khoury, Henri A.; and Tompkins, Bruce E., 4,600,936, Cl. 357-79.000.

International Ferrox Co., Establishment: *See*—
Vallak, Hannes, 4,600,560, Cl. 422-41.000.

International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,600,576, Cl. 424-49.000.

International Paper Company: *See*—
Quaintance, Benjamin W., 4,600,142, Cl. 229-143.000.

International Standard Electric Corporation: *See*—
Rabaey, Dirk H. L. C., 4,600,901, Cl. 332-11.00D.
Scarr, Robert W. A.; and Bingham, John, 4,601,027, Cl. 370-3.000.

International Telephone & Telegraph Corp.: *See*—
Nieman, Gerald R.; Thompson, James E.; Couper, William D.; and Clyatt, Clarence L., III, 4,600,262, Cl. 339-147.00R.

Internationale Octroi Maatschappij "Octropa" B.V.: *See*—
de Jongh, Rudolph O.; and van Dijk, Cornelis, 4,600,701, Cl. 502-159.000.

Intevep, S.A.: *See*—
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., 4,600,703, Cl. 502-210.000.

Inventing S.A.: *See*—
Wallsten, Hans I., 4,600,599, Cl. 427-34.000.

IPCO Corporation: *See*—
Weissman, Bernard, 4,600,392, Cl. 433-225.000.

Isaevich, Leonid A.: *See*—
Stepanenko, Alexandr V.; Isaevich, Leonid A.; and Moisinovich, Ljudmila I., 4,599,880, Cl. 72-94.000.

Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, to Fuji Electrochemical Co., Ltd. Piezoelectric buzzer with circuit elements mounted on nodal areas. 4,600,851, Cl. 310-324.000.

Ise, Yoji, to Myotoku Ltd. Fluid feeding valve and a vacuum chuck apparatus using same. 4,600,230, Cl. 294-64.200.

Ise, Yoji; and Kawada, Masakichi, to Myotoku, Ltd. Ejector pump having an electromagnetic motive fluid valve. 4,600,363, Cl. 417-187.000.

Isernhagen, Fritz: *See*—
Feldmann, Joachim; and Isernhagen, Fritz, 4,600,090, Cl. 188-218.0XL.

Ishida, Hiroshi; and Ushiyama, Shigeyuki, to Fanuc Ltd. Pulse encoder having a circuit for diagnosing abnormalities. 4,600,835, Cl. 250-231.0SE.

Ishida, Ichiro, to Nippon Electric Co., Ltd. Josephson memory circuit. 4,601,015, Cl. 365-162.000.

Ishida, Tsuyoshi: *See*—
Kizu, Shuji; Ishida, Tsuyoshi; Hiramatsu, Kenichi; and Miura, Junji, 4,600,843, Cl. 250-578.000.

Ishigaki, Kunio: *See*—
Nakamura, Taku; Hirano, Mitsunori; Ogawa, Masasi; and Ishigaki, Kunio, 4,600,687, Cl. 430-529.000.

Ishigami, Shinji: *See*—
Nomura, Satoshi; and Ishigami, Shinji, 4,600,587, Cl. 426-19.000.

Ishii, Fumio; and Inaba, Yoshihiro, to Konishiroku Photo Industry Co., Ltd. Thermal transfer recording medium. 4,600,628, Cl. 428-216.000.

Ishii, Takaaki: *See*—
Tatsumi, Kaoru; Kishida, Takao; Marui, Kuniyoshi; and Ishii, Takaaki, 4,600,809, Cl. 179-2.0EA.

Ishikawa, Tadashi: *See*—
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kato, Heiji; and Shiozaki, Hiroyuki, 4,599,770, Cl. 29-113.00R.

Ishikura, Nanako. Tile having nozzle and means for fixation thereof to a roof. 4,599,828, Cl. 52-19.000.

Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,600,638, Cl. 428-323.000.

Ishimura, Yozo, to Matsushita Electric Industrial Co., Ltd. Heating time control means for a heating appliance. 4,600,826, Cl. 219-492.000.

Ishizaki, Yoichi: *See*—
Hirota, Takao; and Ishizaki, Yoichi, 4,600,154, Cl. 241-1.000.

Isogai, Hideaki: *See*—
Kitano, Kouichi; and Isogai, Hideaki, 4,601,014, Cl. 365-155.000.

Isover Saint-Gobain: *See*—
Kafka, Bernard; Meunier, Jean-Paul; and Have, Serge, 4,600,637, Cl. 428-318.400.

Itako, Eiji: *See*—
Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, 4,600,094, Cl. 194-217.000.

Italimpianti Societa Italiana Impianti p.a.: *See*—
Falco, Giulio; and Mannucci, Ivo, 4,600,181, Cl. 266-102.000.

Iten, Clemens A., to American Safety Razor Company. Razor connector. 4,599,793, Cl. 30-47.000.

Ito, Hiroshi: *See*—
Tsuji, Shuji; Ito, Hiroshi; and Saka, Kazuhiko, 4,601,057, Cl. 382-51.000.

Ito, Katsumi; and Ysohida, Jituo, to Kubota, Ltd. Automatic running work vehicle. 4,600,999, Cl. 364-513.000.

Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, to Matsushita Electric Industrial Co. Ltd. Discharge lamp operation apparatus. 4,600,862, Cl. 315-358.000.

Ito, Mikio: *See*—
Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.

Ito, Noboru: *See*—
Iwasa, Eiji; and Ito, Noboru, 4,600,675, Cl. 430-106.600.

Itoga, Kouyu: *See*—
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,600,219, Cl. 285-55.000.

Itoh, Akira: *See*—
Emoto, Kazuhiro; and Itoh, Akira, 4,600,674, Cl. 430-72.000.

ITT Corporation: *See*—
DeChamp, David W.; and Clayatt, Clarence L., III, 4,600,263, Cl. 339-177.00R.
Hargrave, Franklin; and Middleton, Francisco A., 4,601,029, Cl. 370-67.000.

ITT Industries, Inc.: *See*—
Klostermann, Gerd; and Henein, Nabil, 4,599,924, Cl. 83-50.000.

Ivan, Steve D., to Gulf & Western Manufacturing Company. Spare tire handling mechanism. 4,600,352, Cl. 414-463.000.

Iwanami, Junko: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.

Iwasa, Eiji; and Ito, Noboru, to Minolta Camera Kabushiki Kaisha. Magnetic carrier for electrostatic latent image development. 4,600,675, Cl. 430-106.600.

Iwasaki, Katsuyo; Konosu, Osamu; Kihara, Atsushi; and Kamada, Masayasu, to Matsushita Electronics Corp. Color cathode ray tube apparatus to modify deflection magnetic fields. 4,600,858, Cl. 313-413.000.

Izawa, Koji: *See*—
Yoneyama, Tsuneo; and Izawa, Koji, 4,601,003, Cl. 364-518.000.

J. I. Case Company: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; and Benson, Richard E., 4,599,852, Cl. 56-15.800.
Mueller, George R.; and Huitema, Thomas W., 4,600,966, Cl. 361-166.000.

Jablonski, Pierre: *See*—
Sciaky, Mario; Leonard, Michel; Jablonski, Pierre; and Marianne, Jean-Jacques, 4,600,136, Cl. 228-45.000.

Jackson, Winston J., Jr.; and Watkins, Joseph J., to Eastman Kodak Company. Aromatic polyesters derived from 2,3-butanediol. 4,600,768, Cl. 528-308.000.

Jacob, Ezekiel J. Ion-implanted endodontic post. 4,600,391, Cl. 433-220.000.

Jacobson, Larry A.: *See*—
Steinman, Donald K.; and Jacobson, Larry A., 4,600,838, Cl. 250-270.000.

Jacov, Snitovski. Improvement in ceiling blocks. 4,599,839, Cl. 52-309.120.

James, James R.; Johnson, Reginald H.; Henderson, Ann; and Ponting, Mary H., to National Research Development Corporation. Electromagnetic medical applicators. 4,600,018, Cl. 128-804.000.

James River/Dixie-Northern, Inc.: *See*—
Watt, William R., 4,600,462, Cl. 156-278.000.

Janda, Rolf: *See*—
Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, 4,600,390, Cl. 433-218.000.

Jankowiak, Henry: *See*—
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.

Janome Sewing Machine Industry Co., Ltd.: *See*—
Kongoh, Takeshi; and Tanaka, Haruhiko, 4,599,962, Cl. 112-454.000.
Sano, Yasuro; and Murakami, Eiji, 4,599,959, Cl. 112-266.100.

Japan Atomic Energy Research Institute: *See*—
Fujine, Sachio; Saito, Keiichiro; and Shiba, Koreyuki, 4,600,566, Cl. 423-179.500.

Japan Styrene Paper Corporation: *See*—
Yoshimura, Shohei; and Adachi, Akira, 4,600,636, Cl. 428-304.400.

Japan Vilene Co., Ltd.: *See*—
Nakai, Kiyoto; and Hosokawa, Kanji, 4,600,605, Cl. 427-379.000.

Jeffers, Larry A.: *See*—
Berthold, John W., III; Jeffers, Larry A.; and Thompson, Larry B., 4,600,836, Cl. 250-231.00P.

Jennings, James R., to Imperial Chemical Industries PLC. Catalyst. 4,600,704, Cl. 502-318.000.

Jenoptik Jena GmbH: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.

Jens, Richard A.: *See*—
Hong, Jauwhei; Jens, Richard A.; Shen, Steve S.; and Manson, Earle L., Jr., 4,600,659, Cl. 428-471.000.

Jensen, Homer, to Litton Industries, Inc. Apparatus for orienting a magnetometer. 4,600,886, Cl. 324-301.000.

Jero, John P.; Loda, Michael A.; and Slusarek, William L., to Caterpillar Tractor Co. Apparatus and method for controlling a sonic device. 4,599,899, Cl. 73-584.000.

Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., to Megabar Explosives Corporation. Microknit composite explosives and processes for making same. 4,600,450, Cl. 149-19.300.

Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., to Megabar Explosives Corporation. Perchlorate based microknit composite explosives and processes for making same. 4,600,451, Cl. 149-19.300.

Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., to Megabar Explosives Corporation. Eutectic microknit composite explosives and processes for making same. 4,600,452, Cl. 149-19.300.

Jessup, Peter J.; Brass, Stephen G.; and Croudace, Michael C., to Union Oil Company of California. Gasoline compositions containing carbonates. 4,600,408, Cl. 44-70.000.

Jeter, Lewis M.: *See*—
Horton, James P.; Cebe, Jerry F.; Hagemes, Dave; and Jeter, Lewis M., 4,599,991, Cl. 126-345.000.

Jira, Reinhard: *See*—
Eck, Herbert; Menzel, Hartmut; Jira, Reinhard; and Prasse, Alfred, 4,600,790, Cl. 556-421.000.

Jo, Hidetaka: *See*—
Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, 4,600,492, Cl. 204-298.000.

Johansson, Elisabet: *See*—
Larsson, Bernt; Nobelius, Gunilla; and Johansson, Elisabet, 4,600,735, Cl. 523-216.000.

Johansson, Johan G. I.: *See*—
Reinhall, Rolf B.; and Johansson, Johan G. I., 4,600,475, Cl. 162-261.000.

John Brown Inc.: *See*—
Gillman, Tommie D.; and McKimmy, Dirk E., 4,600,376, Cl. 425-346.000.

John M. Henderson and Company Limited: *See*—
Murphy, Arthur D.; and Grattidge, Alan E. T., 4,599,967, Cl. 118-72.000.

John Thomas Batts, Inc.: *See*—
Blanchard, Russell O., 4,600,132, Cl. 223-95.000.

Johnson, Gary R.: *See*—
Sabo, Michael K.; and Johnson, Gary R., 4,600,120, Cl. 221-107.000.

Johnson, Mark: *See*—
DiStefano, Thomas H.; and Johnson, Mark, 4,600,837, Cl. 250-235.000.

Johnson, Orlin W.: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; and Benson, Richard E., 4,599,852, Cl. 56-15.800.

Johnson, Reginald H.: *See*—
James, James R.; Johnson, Reginald H.; Henderson, Ann; and Ponting, Mary H., 4,600,018, Cl. 128-804.000.

Johnson, Rex M.: *See*—
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.

Johnson, Robert C.: *See*—
Seith, Nancy; and Johnson, Robert C., 4,599,996, Cl. 128-25.00R.

Johnson, Robert E. Pivotally mounted diver's signal flag. 4,599,965, Cl. 116-209.000.

Johnson, Roger F., to Cybot, Inc. Modular robotics system with basic interchangeable parts. 4,600,355, Cl. 414-680.000.

Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., to Boro Recycling, Inc. Apparatus for crushing containers. 4,599,941, Cl. 100-215.000.

Johnson, Ronald W., to Dover Corporation. Control mechanisms suitable for actuating power-operated locks. 4,599,876, Cl. 70-344.000.

Jones, Arthur A., to Nautilus Sports/Medical Industries, Inc. Exercising machine with variable resistance. 4,600,196, Cl. 272-134.000.

Jonsas, Mats, to Autopart Sweden Ab. Sun visor for motor vehicles and bearing means therefore. 4,600,234, Cl. 296-97.00K.

Joseph, Robert R.; and Wong, Man-Chong, to International Business Machines Corporation. Composite insulator structure. 4,600,624, Cl. 428-161.000.

Joseph, Theodore H.: *See*—
Pitchon, Esra; O'Rourke, Joseph D.; and Joseph, Theodore H., 4,600,472, Cl. 159-4.400.

Joseph, William A.: *See*—
Holt, Ronald R.; Joseph, William A.; and Zeissler, Edward J., 4,601,004, Cl. 364-557.000.

Josuran, Peter: *See*—
Kobler, Armin; and Josuran, Peter, 4,599,956, Cl. 112-89.000.

Joyeux, Didier: *See*—
Vermot-Gaud, Jacques; and Joyeux, Didier, 4,600,322, Cl. 400-124.000.

Junior, Kenneth E.; Byrd, James D.; and Hightower, James O., Jr., to Thiokol Corporation. Polybenzimidazole polymer and powder filler reinforced elastomeric composition for use as a rocket motor insulation. 4,600,732, Cl. 523-138.000.

K & K Manufacturing, Inc.: *See*—
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.

Kabel- und Gummiwerke, Aktiengesellschaft abgekurzt: *See*—
Ludwigs, Hermann, 4,600,176, Cl. 254-134.3FT.

"Kabelwerk Eupen", Manufactures de Cables Electrique et de Caoutchouc, Societe Anonyme, en abrege : *See*—
Ludwigs, Hermann, 4,600,176, Cl. 254-134.3FT.

Kable, Robert G., to Scriptel Corporation. Electrographic apparatus. 4,600,807, Cl. 178-19.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Murase, Noriyoshi, 4,600,139, Cl. 228-184.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nakatani, Tohru; and Akiyama, Teruo, 4,600,364, Cl. 417-216.000.
Omachi, Yoshio, 4,599,983, Cl. 123-497.000.

Kabushiki Kaisha Nipponcoinco: *See*—
Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, 4,600,094, Cl. 194-217.000.

Kabushiki Kaisha Tokuda Seisakusho: *See*—
Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, 4,600,492, Cl. 204-298.000.

Kabushiki Kaisha Toshiba: *See*—
Fujimoto, Shigeru; Ohte, Satoshi; Kondo, Hirofumi; Matsumoto, Takuji; and Fujita, Takafumi, 4,599,834, Cl. 52-167.000.
Kawakami, Hiroshi, 4,601,026, Cl. 369-38.000.
Koga, Takashi; and Hitomi, Hisakazu, 4,600,897, Cl. 331-113.00R.
Nakagome, Hideki; and Yasuda, Satoshi, 4,599,866, Cl. 62-3.000.
Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, 4,600,492, Cl. 204-298.000.
Sakai, Takami; and Imai, Koji, 4,600,981, Cl. 363-35.000.
Sugimoto, Yasuhiro, 4,600,893, Cl. 330-252.000.
Tanaka, Shun-ichiro, 4,601,050, Cl. 378-18.000.
Tatsumi, Kaoru; Kishida, Takao; Marui, Kuniyoshi; and Ishii, Takaaki, 4,600,809, Cl. 179-2.0EA.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, 4,600,437, Cl. 106-74.000.

Kafka, Bernard; Meunier, Jean-Paul; and Have, Serge, to Isover Saint-Gobain. Process for the continuous production of composite foam panels and resultant product. 4,600,637, Cl. 428-318.400.

Kafri, Oded; and Livnat, Aminadav, to State of Israel, Atomic Energy Commission, The. Optical level. 4,600,304, Cl. 356-138.000.

Kagabu, Shinzo: *See*—
Shiokawa, Kozo; Kagabu, Shinzo; and Moriya, Koichi, 4,600,792, Cl. 560-12.000.

Kageyama, Yoshiyuki: *See*—
Fujimura, Itaru; Ide, Yukio; Kageyama, Yoshiyuki; and Kunita, Masako, 4,600,672, Cl. 430-64.000.

Kaiser, Emil T.; and Musso, Gary F., to Salk Institute Biotechnology/Industrial Associates, Inc., The. Process and composition for amino-terminal, α-aspartyl and α-glutamyl dipeptides and dipeptide esters. 4,600,532, Cl. 260-998.210.

Kalani, James: *See—*
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.

Kalisz, John B., to Lockheed Corporation. Aircraft stores vertical extension and retraction system. 4,600,171, Cl. 244-137.00A.

Kalk, Franklin D.: *See—*
Spong, Fred W.; Muchnik, Boris J.; and Kalk, Franklin D., 4,600,682, Cl. 430-270.000.

Kamada, Masayasu: *See—*
Iwasaki, Katsuyo; Konosu, Osamu; Kihara, Atsushi; and Kamada, Masayasu, 4,600,858, Cl. 313-413.000.

Kamata, Yoshikiyo; and Nagao, Yoshiaki, to Kioritz Corporation. Reed valve. 4,599,978, Cl. 123-73.00V.

Kamen, Dean L., to Baxter Travenol Laboratories. Fluid flow control system. 4,600,401, Cl. 604-65.000.

Kameo, Kazuya: *See—*
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, 4,600,540, Cl. 558-255.000.

Kaminaga, Hiromitsu, to Yoshida Kogyo K. K. Joint assembly of horizontally opposed curtain wall units. 4,599,838, Cl. 52-235.000.

Kaminaka, Kouji: *See—*
Mitsuhashi, Wataru; Kaminaka, Kouji; and Kotani, Kaname, 4,599,824, Cl. 49-141.000.

Kamiya, Yoshiyasu: *See—*
Takagi, Kaneyuki; Kawai, Yoichi; and Kamiya, Yoshiyasu, 4,600,748, Cl. 525-133.000.

Kamo, Yoshihisa: *See—*
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Momata, Kazuhiro; and Arai, Shinichi, 4,600,965, Cl. 361-153.000.

Kanazawa, Kiyoto: *See—*
Hosaka, Akihiko; Okuyama, Kiyotaka; and Kanazawa, Kiyoto, 4,600,650, Cl. 428-413.000.

Kanda, Tetsuo: *See—*
Yamamoto, Shizuo; Kanda, Tetsuo; Suzuki, Nobuaki; and Matsuda, Hiroyuki, 4,600,076, Cl. 181-233.000.

Kandatsu, Kiyoshi: *See—*
Uchida, Naoshi; and Kandatsu, Kiyoshi, 4,600,908, Cl. 335-8.000.

Kaneko, Katsuyuki: *See—*
Uya, Masaru; and Kaneko, Katsuyuki, 4,601,007, Cl. 364-784.000.

Kaneko, Masaharu: *See—*
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.

Kaneko, Shigeru; Hirata, Yoshiaki; and Nohara, Yoshio, to Bridgestone Corporation. Apparatus for carrying unvulcanized pneumatic tires in tire vulcanizer. 4,600,370, Cl. 425-38.000.

Karl Mengele & Sohne: *See—*
Vogt, Adolf, 4,600,349, Cl. 414-225.000.

Karmen, Arthur; and Lasky, Fred D., to Albert Einstein College of Medicine of Yeshiva University, A division of Yeshiva University. Immunoassay. 4,600,690, Cl. 435-7.000.

Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Swivel snap hook of synthetic resin and method of manufacturing the same. 4,599,767, Cl. 24-236.000.

Kashiwa, Norio: *See—*
Fukui, Kunisuke; and Kashiwa, Norio, 4,600,762, Cl. 526-348.600.

Kastenhuber, Manfred; Eckel, Alfred; and Bock, Erich, to Diehl GmbH & Co. Pivoting guidance mechanism for small-calibered projectiles. 4,600,167, Cl. 244-3.280.

Katayama, Akira: *See—*
Maida, Osamu; and Katayama, Akira, 4,600,289, Cl. 354-448.000.

Kato, Heiji; and Shiozaki, Hiroyuki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Roll for rolling mill. 4,599,770, Cl. 29-113.00R.

Kato, Motokazu, to Fujitsu Limited. Data processing system. 4,601,008, Cl. 364-900.000.

Kato, Yoshiaki: *See—*
Kitahara, Hisashi; Hattori, Noboru; Kato, Yoshiaki; and Hitomi, Nobuteru, 4,600,071, Cl. 180-53.800.

Katoh, Katsunori: *See—*
Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, 4,600,688, Cl. 430-558.000.

Katoh, Yasuhiro: *See—*
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Momata, Kazuhiro; and Arai, Shinichi, 4,600,965, Cl. 361-153.000.

Katsura, Takashi: *See—*
Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, 4,600,862, Cl. 315-358.000.

Katt, Linda K.: *See—*
Raychok, Paul G., Jr.; and Katt, Linda K., 4,600,618, Cl. 428-92.000.

Katz, Leonard R.; and Desmarchais, Walter E., to Westinghouse Electric Corp. Reactor cavity. 4,600,553, Cl. 376-292.000.

Kawada, Masakichi: *See—*
Ise, Yoji; and Kawada, Masakichi, 4,600,363, Cl. 417-187.000.

Kawai, Hisasi: *See—*
Hayashi, Ikuo; Idogaki, Takaharu; and Kawai, Hisasi, 4,600,867, Cl. 318-341.000.
Idogaki, Takaharu; Hayashi, Ikuo; and Kawai, Hisasi, 4,600,871, Cl. 318-653.000.

Kawai, Yoichi: *See—*
Takagi, Kaneyuki; Kawai, Yoichi; and Kamiya, Yoshiyasu, 4,600,748, Cl. 525-133.000.

Kawajusanyo Kogyo Co., Ltd.: *See—*
Fujii, Hideichi; Miyake, Takehito; and Konishi, Hiromu, 4,600,241, Cl. 297-457.000.

Kawakami, Hiroshi, to Kabushiki Kaisha Toshiba. Autochanger type disc player. 4,601,026, Cl. 369-38.000.

Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,600,688, Cl. 430-558.000.

Kawakubo, Osamu; Munemoto, Eiji; and Okubora, Akihiko, to Sony Corporation. Method of producing discharge display device. 4,600,397, Cl. 445-6.000.

Kawamura, Hideaki: *See—*
Nozawa, Ryoichiro; Kawamura, Hideaki; Sasaki, Takao; and Hirose, Satoru, 4,600,985, Cl. 364-169.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujii, Hideichi; Miyake, Takehito; and Konishi, Hiromu, 4,600,241, Cl. 297-457.000.
Nishida, Hiroshi, 4,600,041, Cl. 141-95.000.
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,600,219, Cl. 285-55.000.

Kawasaki Steel Corporation: *See—*
Fujita, Sadao; Toyokawa, Akira; Mutoh, Shinichiro; Shimomukai, Eishu; and Ueda, Kenji, 4,600,378, Cl. 432-8.000.

Kawashima, Hiromi: *See—*
Arakawa, Hideki; and Kawashima, Hiromi, 4,601,020, Cl. 365-226.000.

Kawashima, Yoshinori: *See—*
Watanabe, Masaki; Yagasaki, Akio; and Kawashima, Yoshinori, 4,600,074, Cl. 180-251.000.

Kawauchi, Yasunobu, to Toshiba Kikai Kabushiki Kaisha. Arrangement for inspecting circuit patterns drawn on a mask. 4,600,996, Cl. 364-491.000.

Kawazu, Ryuji: *See—*
Yamashita, Yoshio; and Kawazu, Ryuji, 4,600,684, Cl. 430-296.000.

Kayano, Shinpei: *See—*
Fukumoto, Takaaki; Hama, Masaharu; and Kayano, Shinpei, 4,600,888, Cl. 324-439.000.

Kearsley, Andrew J.: *See—*
Andrews, Anthony J.; Errey, Keith H.; Kearsley, Andrew J.; and Webb, Colin E., 4,601,040, Cl. 372-57.000.

Keefer, Ray A., to B. F. Goodrich Company, The. Railroad car diaphragm. 4,599,947, Cl. 105-15.000.

Keene, Terrell M.: *See—*
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.

Kelch, Eugene W.: *See—*
Niewald, Jack L.; and Kelch, Eugene W., 4,600,354, Cl. 414-607.000.

Keller, John A., Jr.: *See—*
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,600,517, Cl. 252-32.70E.

Keller, John H.: *See—*
Desilets, Brian H.; Gunther, Thomas A.; Hendricks, Charles J.; and Keller, John H., 4,600,464, Cl. 156-345.000.

Keller, Walter L. Draftsman's dimensional divider. 4,599,802, Cl. 33-192.000.

Kelly, Frank M.: *See—*
Ellis, Darwin L.; and Kelly, Frank M., 4,599,846, Cl. 53-331.500.

Kelly, Robert G.; and Spang, Walter G., to Norton Company. Machine for efficient assembly of biased yarn arrays. 4,600,468, Cl. 156-440.00.

Kelsey-Hayes Company: *See—*
Bruder, John R.; Sivulka, Gerald M.; and Tribe, Leonard T., 4,600,820, Cl. 200-84.00C.

Kendall Company, The: *See—*
Gilman, Thomas, 4,600,001, Cl. 128-156.000.
Rosenberg, Helmut W. G., 4,600,402, Cl. 604-96.000.

Kennecott Corporation: *See—*
Basalyk, Peter I.; Lukco, Dorothy; Mooney, J. Robert; and Seifert, Dexter C., 4,600,443, Cl. 134-3.000.

Kennedy, Richard A., to General Motors Corporation. Dual mode crystal phase shift transistor oscillator. 4,600,899, Cl. 331-116.00R.

Kenney, Thomas A.; and Holbrow, Frederick W. Sailboat hull. 4,599,964, Cl. 114-124.000.

KenoGard AB: *See—*
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, 4,600,429, Cl. 71-86.000.

Kenrich Petrochemicals, Inc.: *See—*
Sugerman, Gerald; and Monte, Salvatore J., 4,600,789, Cl. 556-17.000.

Kent, Ernest W., to United States of America, Commerce. Image processor. 4,601,055, Cl. 382-49.000.

Kerber, Dathan R.; Johnson, Orlin W.; and Benson, Richard E., to J. I. Case Company. Adjustable leaf spring suspension for flexible cutterbar. 4,599,852, Cl. 56-15.800.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Klatt, Karl-Heinz; Wenzl, Helmut; and Meuffels, Paul, 4,600,660, Cl. 428-607.000.

Kerr, Robert L., Jr. Transport support for freestanding umbilical accessory. 4,600,209, Cl. 280-400.000.

Kesten, Martin: *See*—
Carlson, Leroy H., Jr.; and Kesten, Martin, 4,599,926, Cl. 83-100.000.
Kester, Bruce J.: *See*—
Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., 4,599,912, Cl. 74-501.00R.
Kester, Dale C.: *See*—
Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., 4,599,912, Cl. 74-501.00R.
KFA—Kernforschungsanlage Julich GmbH: *See*—
Wyrwich, Helmut; Graschew, Georgi; Chatzipetros, Johann; and Feinendegen, Ludwig E., 4,599,800, Cl. 33-143.00C.
Khoury, Henri A.; and Tompkins, Bruce E., to International Business Machines Corporation. Chip registration mechanism. 4,600,936, Cl. 357-79.000.
Kice Metal Products, Inc.: *See*—
Barton, William J., 4,600,415, Cl. 55-294.000.
Kihara, Atsushi: *See*—
Iwasaki, Katsuyo; Konosu, Osamu; Kihara, Atsushi; and Kamada, Masayasu, 4,600,858, Cl. 313-413.000.
Kilburn, Winston S. Portable free stall. 4,599,972, Cl. 119-27.000.
Kilvington, John, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Receivers for navigation satellite systems. 4,601,005, Cl. 364-602.000.
Kim, Bumman; and Saunier, Paul, to Texas Instruments Incorporated. Process for forming a T-shaped gate structure. 4,599,790, Cl. 29-571.000.
Kim, Ick W.: *See*—
Cade, Paul E.; El-Kareh, Badih; and Kim, Ick W., 4,599,792, Cl. 29-576.00W.
Kim, Myung K.; and Lee, Se E. Method of power generation and its apparatus utilizing gravitation force and buoyancy. 4,599,857, Cl. 60-495.000.
Kimberly-Clark Corporation: *See*—
Rajala, Gregory J.; and Shavlik, Robert J., 4,600,549, Cl. 264-154.000.
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,600,404, Cl. 604-387.000.
Kimmel, David J.: *See*—
Feldman, Steven; and Kimmel, David J., 4,600,810, Cl. 179-175.30R.
Kimura, Akinori: *See*—
Ohtsuka, Shuichi; Yoda, Akira; Kimura, Akinori; and Takahashi, Isoji, 4,600,291, Cl. 355-3.00R.
Kimura, Shigeru, to Nifco Inc. Illuminator. 4,600,978, Cl. 362-365.000.
Kimura, Toshihiko: *See*—
Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, 4,600,688, Cl. 430-558.000.
Kindle, Karen L.; Mainzer, Stanley E.; Marlatt, Deborah L.; and Sawyer, Constance B., to Corning Glass Works. Thermostable alpha amylase having a low requirement for calcium ions, derived from a bacillus microorganism. 4,600,693, Cl. 435-176.000.
King-Seeley Thermos Co.: *See*—
Raymer, Doyle; Eveland, Michael; and Heyden, Dennis J., 4,600,148, Cl. 239-29.300.
Kinney, Thomas B.: *See*—
Gelineau, Frederick D.; and Kinney, Thomas B., 4,599,808, Cl. 34-27.000.
Kinoshita, Tsuneo, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a custom-circuit LSI, and a gate array device. 4,600,995, Cl. 364-491.000.
Kinsolving, Clyde R.: *See*—
Georgiev, Vassil S.; and Kinsolving, Clyde R., 4,600,782, Cl. 548-216.000.
Kioritz Corporation: *See*—
Baba, Toru, 4,599,796, Cl. 30-276.000.
Kamata, Yoshikiyo; and Nagao, Yoshiaki, 4,599,978, Cl. 123-73.00V.
Kircher, Dieter: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,600,243, Cl. 303-92.000.
Kirii, Kazunari: *See*—
Asai, Akio; Ando, Yukito; and Kirii, Kazunari, 4,599,887, Cl. 72-453.130.
Kishida, Takao: *See*—
Tatsumi, Kaoru; Kishida, Takao; Marui, Kuniyoshi; and Ishii, Takaaki, 4,600,809, Cl. 179-2.0EA.
Kishimoto, Takashi: *See*—
Yamasaki, Tetsuya; Kishimoto, Takashi; and Yamauchi, Ichirou, 4,600,267, Cl. 350-96.150.
Kitahara, Hisashi; Hattori, Noboru; Kato, Yoshiaki; and Hitomi, Nobuteru, to Nissan Motor Co., Ltd. Flow control apparatus for power steering. 4,600,071, Cl. 180-53.800.
Kitakohji, Toshisuke; Takeda, Shiro; Nakajima, Minoru; and Tokunaga, Hiroshi, to Fujitsu Limited. Patterning process using ladder-type organosiloxane resin and process for production of electronic devices utilizing said patterning process. 4,600,685, Cl. 430-313.000.
Kitano, Kouichi; and Isogai, Hideaki, to Fujitsu Limited. Semiconductor memory with word line charge absorbing circuit. 4,601,014, Cl. 365-155.000.
Kizu, Shuji; Ishida, Tsuyoshi; Hiramatsu, Kenichi; and Miura, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Photoelectric conversion apparatus. 4,600,843, Cl. 250-578.000.
Klatt, Karl-Heinz; Wenzl, Helmut; and Meuffels, Paul, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Foil material for the storage of hydrogen. 4,600,660, Cl. 428-607.000.
Klaue, Kaj, to Synthes AG. Drill guide for use with surgical compression plates. 4,599,999, Cl. 128-92.0EB.
Klauke, Erich: *See*—
Marhold, Albrecht; and Klauke, Erich, 4,600,787, Cl. 549-362.000.
Klaus, Franz: *See*—
Fichtner, Hans E.; and Klaus, Franz, 4,600,821, Cl. 219-10.510.
Kleimeyer, David L.; Fletcher, Larry N.; Stacy, Alan D.; and Smillie, Allan M., to Armco Inc. Process for desulfurization of ferrous metal melts. 4,600,434, Cl. 75-58.000.
Klein, Klausjorg: *See*—
Patzschke, Hans-Peter; Goebel, Armin; and Klein, Klausjorg, 4,600,485, Cl. 204-181.700.
Kleindienst GmbH: *See*—
Geiger, Friedrich, 4,599,814, Cl. 38-51.000.
Kleinholz, Edward O. Vapor fuel supply systems for internal combustion engines. 4,599,984, Cl. 123-557.000.
Klemm, Ernest J.: *See*—
Edman, Walter W.; and Klemm, Ernest J., 4,600,028, Cl. 132-7.000.
Kline, Mark L.: *See*—
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,600,218, Cl. 285-50.000.
Klingensmith, James D.: *See*—
Hovland, Lyle W.; and Klingensmith, James D., 4,599,785, Cl. 29-526.00R.
Klostermann, Gerd; and Henein, Nabil, to ITT Industries, Inc. Process and device to apply a bearing eye or a transverse perforation in the clevis of the actuating rod of a brake power booster. 4,599,924, Cl. 83-50.000.
Knabel, Walter, to Marker International Company. Electronic ski binding and a method for its operation. 4,600,212, Cl. 280-611.000.
Knabel, Walter: *See*—
Sedlmair, Gerhard; and Knabel, Walter, 4,600,213, Cl. 280-618.000.
Knapp, David H.; and Lafler, Robert E., to Westvaco Corporation. Selectively absorbent mask printing process. 4,600,629, Cl. 428-201.000.
Knauss, Hermann, to E.G.O. Elektro-Gerate Blanc u. Fischer. Temperature sensor. 4,599,993, Cl. 126-374.000.
Knepshield, Thomas R., to Vista International Packaging, Inc. Casing ring device. 4,599,764, Cl. 17-41.000.
Knight, Kenneth F.: *See*—
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., 4,599,784, Cl. 29-450.000.
Ko, Sung H., to Il Kwang Co., Ltd. Device for the perception of gas flow. 4,600,034, Cl. 137-554.000.
Kobayashi, Masaaki: *See*—
Igata, Kouichi; Deguchi, Yoshihiro; and Kobayashi, Masaaki, 4,600,952, Cl. 360-10.300.
Kobler, Armin; and Josuran, Peter, to Aktiengesellschaft Adolph Saurer. Borer apparatus for an embroidering machine. 4,599,956, Cl. 112-89.000.
Kobler, Ingo, to M.A.N. - Roland Druckmaschinen Aktiengesellschaft. Electrostatic-charge-and chemical-attack-resistant printing cylinder construction. 4,599,943, Cl. 101-217.000.
Kobori, Michio: *See*—
Higashi, Takehiro; Kobori, Michio; Yoshino, Zenichi; and Morimoto, Seiichi, 4,600,477, Cl. 203-26.000.
Koch Refining Company: *See*—
Reeder, Perry E., 4,600,567, Cl. 423-242.000.
Kocian, Roger J.: *See*—
Church, George R.; and Kocian, Roger J., 4,599,923, Cl. 82-36.00R.
Kock, Ronald W.: *See*—
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,600,458, Cl. 156-199.000.
Kodama, Naoki: *See*—
Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, 4,601,013, Cl. 365-36.000.
Koebernick, Wolfgang: *See*—
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, 4,600,778, Cl. 546-249.000.
Koffler, Marshall N. Underpad holder. 4,599,756, Cl. 5-484.000.
Koga, Takashi; and Hitomi, Hisakazu, to Kabushiki Kaisha Toshiba. Voltage-controlled oscillator of emitter-coupled astable multivibrator type. 4,600,897, Cl. 331-113.00R.
Kogawa, Takashi; Teramoto, Kazuyoshi; and Hashimoto, Takeshi, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Memory system and accessing method. 4,601,009, Cl. 364-900.000.
Kohayakawa, Yoshimi; and Matsushita, Machiko, to Canon Kabushiki Kaisha. Apparatus for detecting abnormality in spinal column. 4,600,012, Cl. 128-665.000.
Koike, Shunichi: *See*—
Seki, Nagataka; Koike, Shunichi; and Watanabe, Yukio, 4,600,917, Cl. 340-645.000.
Koizumi, Yukinori; and Harada, Toshimitsu, to Konishiroku Photo Industry Co., Ltd. Video camera. 4,600,949, Cl. 358-229.000.
Koller, Frank H., to Emerson Electric Co. Linear transfer drive for a pick and place material handling apparatus. 4,599,909, Cl. 74-27.000.
Komatsu Zenoah & Co.: *See*—
Kondo, Keiji, 4,600,129, Cl. 222-175.000.
Komatsubara, Michimasa: *See*—
Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, 4,600,941, Cl. 358-121.000.

Kominiak, Andrew A.: *See*—
Stepniak, Frank M.; and Kominiak, Andrew A., 4,600,260, Cl. 339-111.000.

Kondo, Hirofumi: *See*—
Fujimoto, Shigeru; Ohte, Satoshi; Kondo, Hirofumi; Matsumoto, Takuji; and Fujita, Takafumi, 4,599,834, Cl. 52-167.000.

Kondo, Keiji, to Komatsu Zenoah & Co. Chemicals spreader. 4,600,129, Cl. 222-175.000.

Kondo, Sigeuki: *See*—
Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, 4,600,851, Cl. 310-324.000.

Kondoh, Yuji; and Fukushima, Tadahide, to Canon Kabushiki Kaisha. Grip for a camera. 4,600,284, Cl. 354-82.000.

Kongoh, Takeshi; and Tanaka, Haruhiko, to Janome Sewing Machine Industry Co., Ltd. Electronic sewing machine. 4,599,962, Cl. 112-454.000.

Konishi, Hiromu: *See*—
Fujii, Hideichi; Miyake, Takehito; and Konishi, Hiromu, 4,600,241, Cl. 297-457.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujimaki, Yoshihide; Takimoto, Masataka; and Nomori, Hiroyuki, 4,600,292, Cl. 355-3.0SC.
Ishii, Fumio; and Inaba, Yoshihiro, 4,600,628, Cl. 428-216.000.
Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, 4,600,688, Cl. 430-558.000.
Koizumi, Yukinori; and Harada, Toshimitsu, 4,600,949, Cl. 358-229.000.

Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, to Toa Nenryo Kogyo Kabushiki Kaisha. Polyethylene superthin film and a process for the production of the same. 4,600,633, Cl. 428-220.000.

Konosu, Osamu: *See*—
Iwasaki, Katsuyo; Konosu, Osamu; Kihara, Atsushi; and Kamada, Masayasu, 4,600,858, Cl. 313-413.000.

Koo, Kee P.; Dandridge, Anthony; Tveten, Alan B.; and Sigel, George H., Jr., to United States of America, Navy. Fiber optic magnetometer for detecting DC magnetic fields. 4,600,885, Cl. 324-244.000.

Koos, William M., Jr.: *See*—
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,601,046, Cl. 375-38.000.

Kopp, Georg, to SIG Schweizerische Industrie-Gesellschaft. Method and apparatus for driving sealing elements in a packing machine. 4,599,850, Cl. 53-451.000.

Koppers Company, Inc.: *See*—
Okamoto, Yoshiyuki; and Rice, Joseph E., 4,600,784, Cl. 549-39.000.

Korenowski, Theodore F., to TFK Company, Inc. Evaporation method. 4,600,474, Cl. 159-47.300.

Korngold, Emmanuel, to Morton Thiokol, Inc. Electrodialysis apparatus for the chemical maintenance of electroless copper plating baths. 4,600,493, Cl. 204-301.000.

Koshar, Robert J., to Minnesota Mining and Manufacturing Company. Cyclic sulfoperfluoroaliphaticcarboxylic acid anhydrides and amide derivatives thereof. 4,600,774, Cl. 544-85.000.

Koski, Erik B.: *See*—
Hlavac, Harry F.; and Koski, Erik B., 4,599,915, Cl. 74-594.400.

Koster, William G.; and Byrne, Allan B., to Hughes Aircraft Company. Integrated spacecraft cradle and shuttle structure. 4,600,169, Cl. 244-118.100.

Koszi, Louis A.: *See*—
Focht, Marlin W.; Koszi, Louis A.; and Schwartz, Bertram, 4,599,791, Cl. 29-576.00B.

Kotani, Kaname: *See*—
Mitsuhashi, Wataru; Kaminaka, Kouji; and Kotani, Kaname, 4,599,824, Cl. 49-141.000.

Koyama, Kazutaka: *See*—
Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, 4,600,862, Cl. 315-358.000.

Kraft, Rosemarie R.: *See*—
Gerstein, Milton S.; and Kraft, Rosemarie R., 4,600,239, Cl. 297-349.000.

Kraftelektronik AB: *See*—
Soderholm, Rolf, 4,600,877, Cl. 323-324.000.

Kramer Aktiengesellschaft: *See*—
Lindner, Otto; Pelster, Heinrich; Steffan, Guido; and Stuwe, Arnd, 4,600,542, Cl. 260-505.00C.

Kramer, Clark: *See*—
Kramer, Sharon D.; Kramer, John; Kramer, Donald; and Kramer, Clark, 4,600,009, Cl. 128-396.000.

Kramer, Donald: *See*—
Kramer, Sharon D.; Kramer, John; Kramer, Donald; and Kramer, Clark, 4,600,009, Cl. 128-396.000.

Kramer, John: *See*—
Kramer, Sharon D.; Kramer, John; Kramer, Donald; and Kramer, Clark, 4,600,009, Cl. 128-396.000.

Kramer, Sharon D.; Kramer, John; Kramer, Donald; and Kramer, Clark. Tanning system. 4,600,009, Cl. 128-396.000.

Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., to Procter & Gamble Co., The. Method of making an absorbent laminate structure. 4,600,458, Cl. 156-199.000.

Krankkala, Paul L. Fast setting starch-based corrugating adhesive having partially hydrolyzed water soluble polyvinyl alcohol component. 4,600,739, Cl. 524-48.000.

Kraus, Edmund J.: *See*—
Kraus, Robert A.; and Kraus, Edmund J., 4,599,907, Cl. 73-861.740.

Kraus, Heinz: *See*—
Miller, Walter; and Kraus, Heinz, 4,600,203, Cl. 277-237.00R.

Kraus, Robert A.; and Kraus, Edmund J. Mass-flow sensing transducer. 4,599,907, Cl. 73-861.740.

Krause, Lawrence J., to United States of America, Energy. Electroless metal plating of plastics. 4,600,656, Cl. 428-446.000.

Krell, Udo. Three dimensional puzzle. 4,600,199, Cl. 273-153.00S.

Kreutzer, Hans: *See*—
Dost, Willibald; Habenschaden, Kurt; Kreutzer, Hans; and Wasner, Gunter, 4,600,272, Cl. 350-287.000.

Kristinsson, Sigurdur. Device for decapitating fish by a cutting action. 4,599,765, Cl. 17-63.000.

Kroebel, Reinhard: *See*—
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, 4,600,610, Cl. 428-2.000.

Krohn, William T.; McNally, Mark J.; and Abreu, Rene, to Perkin-Elmer Corporation, The. Coherent radiation detecting apparatus. 4,600,307, Cl. 356-346.000.

Kromer, Philip F., III; Srinivasagopalan, Rangarajan; and Fernandez, Raul F., to Racal Data Communications Inc. Carrier-phase adjustment using absolute phase detector. 4,601,044, Cl. 375-17.000.

Kroninger, Paul M., Jr.: *See*—
Freud, Paul J.; and Kroninger, Paul M., Jr., 4,599,906, Cl. 73-861.470.

Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., to K & K Manufacturing, Inc. Portable gage instrument for use in performing precision multiple dimension measurements. 4,599,801, Cl. 33-169.00R.

Kronzer, Timothy L.: *See*—
Kronzer, Phillip J.; Caputo, Nick; Combs, Bernard M.; Conrad, Andrew; Kalani, James; and Kronzer, Timothy L., 4,599,801, Cl. 33-169.00R.

Krude, Werner, to GKN Automotive Components, Inc. Independent wheel suspension using thrust bearing constant velocity universal drive joints as suspension members in combination with a wheel assembly and differential coupled to pivot about a transverse stabilizer. 4,600,072, Cl. 180-73.300.

Krugener, Rolf: *See*—
Huber, Guntram; Gmeiner, Gunter; and Krugener, Rolf, 4,600,237, Cl. 296-223.000.

Krumwiede, John F.; Hilliard, William G.; and Sims, Roy M., to PPG Industries, Inc. Bubbler with protective sleeve or fluid coolant jacket. 4,600,425, Cl. 65-178.000.

Kubo, Yasuhiro: *See*—
Terauchi, Kiyoshi; Kubo, Yasuhiro; and Hiraga, Masaharu, 4,600,367, Cl. 417-360.000.

Kubota, Ltd.: *See*—
Ito, Katsumi; and Ysohida, Jituo, 4,600,999, Cl. 364-513.000.

Kudo, Yukinori; and Suzuki, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital television receiver with digital sync/reproduction circuit. 4,600,937, Cl. 358-21.00R.

Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Howell, Jerald A., to Phillips Petroleum Company. Hydrofining process for hydrocarbon containing feed streams. 4,600,504, Cl. 208-251.00H.

Kulman, James: *See*—
Guha, Subhendu; and Kulman, James, 4,600,801, Cl. 136-249.000.

Kulzer & Co. GmbH: *See*—
Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, 4,600,390, Cl. 433-218.000.

Kumar, Devendra; Fohlen, George M.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Amine terminated bisaspartimide polymer. 4,600,769, Cl. 528-322.000.

Kumasaka, Noriyuki: *See*—
Imura, Ryo; Sugita, Yutaka; and Kumasaka, Noriyuki, 4,600,488, Cl. 204-192.00N.

Kummann, Paul, to Linde Aktiengesellschaft. Two-stage rectification for the separation of hydrocarbons. 4,600,421, Cl. 62-25.000.

Kummer, Rudolf: *See*—
Bertleff, Werner; Muller, Franz-Josef; Kummer, Rudolf; and Harder, Wolfgang, 4,600,726, Cl. 518-701.000.

Kunita, Masako: *See*—
Fujimura, Itaru; Ide, Yukio; Kageyama, Yoshiyuki; and Kunita, Masako, 4,600,672, Cl. 430-64.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ohya, Masaki; and Nishimoto, Yoshiharu, 4,600,616, Cl. 428-36.000.

Kurimoto, Takako: *See*—
Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, 4,600,437, Cl. 106-74.000.

Kuroki, Junsuke; and Sugasawa, Fukashi, to Nissan Motor Company, Limited. Vehicular suspension control system with variable damping characteristics depending upon road condition and vehicle speed. 4,600,215, Cl. 280-707.000.

Kusche, David W.: *See*—
Crane, Paul W.; and Kusche, David W., 4,600,396, Cl. 440-77.000.

Kusumoto, Koji: *See*—
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,600,615, Cl. 428-36.000.

Kwan, Okun. Matrix print head. 4,600,321, Cl. 400-124.000.

La-Man Corporation: *See*—
Mann, David O., 4,600,416, Cl. 55-323.000.

Laakso, Carl W.: *See*—
Grellman, H. Erwin; Laakso, Carl W.; Reagan, John J.; and Roland, Leonard A., 4,600,907, Cl. 333-246.000.
Laas, Harald: *See*—
Broecker, Franz J.; Tavs, Peter; Laas, Harald; and Aders, Wolf-Karlo, 4,600,799, Cl. 568-772.000.
Lafferty, Stephen H., to Wegener Communications, Inc. Compandor noise reduction circuit. 4,600,902, Cl. 333-14.000.
Lafler, Robert E.: *See*—
Knapp, David H.; and Lafler, Robert E., 4,600,629, Cl. 428-201.000.
LaForest, Pierre: *See*—
Gagnon, Pierre; and LaForest, Pierre, 4,600,085, Cl. 187-24.000.
Lagerlund, Inger: *See*—
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, 4,600,429, Cl. 71-86.000.
Lahodny, Johann; and Dreier, Ernst, to Fritz Gegauf AG Bernina-Nahmaschinenfab. Parametrium cutting forceps. 4,600,007, Cl. 128-318.000.
Lamb Technicon Corp.: *See*—
Brems, John H.; and Mason, Arthur C., 4,600,095, Cl. 198-346.200.
Lamm, Foster P.; and Pike, Roscoe A., to United Technologies Corporation. Two-component acrylic modified polyester adhesive. 4,600,738, Cl. 523-500.000.
Lancaster, Gerald M.; and Allen, James A., to Dow Chemical Company, The. High-frequency heatable plastics. 4,600,614, Cl. 428-35.000.
Landis, Michael E.: *See*—
Angevine, Philip J.; Degnan, Thomas F., Jr.; and Landis, Michael E., 4,600,503, Cl. 208-251.00H.
Landsman, Stephen P., to Minnesota Mining and Manufacturing Company. Precision phase synchronization of free-running oscillator output signal to reference signal. 4,600,895, Cl. 331-1.00A.
Landy, Howard; and Landy, Lawrence. Intracranial pressure monitoring probe. 4,600,013, Cl. 128-748.000.
Landy, Lawrence: *See*—
Landy, Howard; and Landy, Lawrence, 4,600,013, Cl. 128-748.000.
Langer, Roger L., to Minnesota Mining and Manufacturing Company. Flexible fibrous endothermic sheet material for fire protection. 4,600,634, Cl. 428-220.000.
Lanz, Martin A.: *See*—
Bednorz, Johannes G.; Lanz, Martin A.; Nievergelt, Hermann; and Pohl, Wolfgang D., 4,600,854, Cl. 310-331.000.
Laragione, Robert: *See*—
Linwood, Gary C.; and Laragione, Robert, 4,600,827, Cl. 219-492.000.
La Rocca, Angelo A.; and Osmanski, Anthony M., to Pennsylvania Power and Light Company. Watthour test circuitry. 4,600,881, Cl. 324-74.000.
Larse Corporation: *See*—
Lubarsky, Daniel P., 4,601,045, Cl. 375-38.000.
Larsen, Robert T.: *See*—
Bailey, Frank V.; Larsen, Robert T.; and VanRens, Russell J., 4,600,046, Cl. 164-34.000.
Larsson, Bernt; Nobelius, Gunilla; and Johansson, Elisabet, to EKA AB. Soil-repellent coating composition. 4,600,735, Cl. 523-216.000.
Larus Corporation: *See*—
McDermott, Noel C., 4,600,816, Cl. 179-190.000.
Laser, Jurgen: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.
Lasky, Fred D.: *See*—
Karmen, Arthur; and Lasky, Fred D., 4,600,690, Cl. 435-7.000.
La Stella, Joseph P.; and Tornabene, Michael G. Ocean wave energy device. 4,599,858, Cl. 60-497.000.
LaTulip, Randy J.: *See*—
Diephouse, Tim R.; LaTulip, Randy J.; Robinson, John W.; and Gantt, Gary R., 4,600,767, Cl. 528-252.000.
Latzko, Richard I.; Marsland, George H.; and Reuteler, Johann F., to Colt Industries Operating Corp. Machine with rotating cutting tool. 4,599,769, Cl. 29-26.00A.
Laumain, Francois-Bernard, to Societe Chimique des Charbonnages S.A. Stable prepolymers of polyisocyanate with hydroxyl functions, a process for their manufacture and their application to the manufacture of polyurethanes. 4,600,730, Cl. 521-167.000.
Lavaleric, Claude: *See*—
Coussau, Jean; and Lavaleric, Claude, 4,600,115, Cl. 220-327.000.
Lavery, Ormand F.: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., 4,600,451, Cl. 149-19.300.
Lavery, Ormond F.: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,452, Cl. 149-19.300.
Lawson, Robert J.: *See*—
Lawson, William J.; and Lawson, Robert J., 4,600,849, Cl. 310-103.000.
Lawson, William J.; and Lawson, Robert J. Fluid-activated motor having magnetic propulsion. 4,600,849, Cl. 310-103.000.
Lea, John D., to Sperry Corporation. Angle tracking system. 4,601,025, Cl. 367-125.000.
Leaver, Helen S.: *See*—
Wiegers, Ben W.; Chou, Eddie C. J.; Bruno, John D.; and Leaver, Helen S., 4,600,435, Cl. 75-119.000.
Ledet, Charles: *See*—
Van Wormer, Richard A.; Baugh, John L.; Ledet, Charles; and Roach, Malcolm, 4,600,058, Cl. 166-382.000.
Lee, Chi-long; and Shyu, Wen-Bin, to Dow Corning Corporation. Hydrophilic silicone-organic copolymer elastomers. 4,600,751, Cl. 525-404.000.
Lee, David M.; Hutchings, David A.; Sieloff, Gloria M.; and Willard, G. Fred, to Owens-Corning Fiberglas Corporation. Melt processable optically anisotropic polymers. 4,600,765, Cl. 528-193.000.
Lee, Jin G. Flea catcher. 4,599,823, Cl. 43-134.000.
Lee, Robert L. Dental cast mounting plate assembly. 4,600,385, Cl. 433-60.000.
Lee, Se E.: *See*—
Kim, Myung K.; and Lee, Se E., 4,599,857, Cl. 60-495.000.
Leever, Harold; and Slominski, Leo J., to MacDermid, Incorporated. Method and composition for electroless nickel deposition. 4,600,609, Cl. 427-438.000.
Lefer, Pierre: *See*—
Schneider, Jean; Gosset, Serge; and Lefer, Pierre, 4,600,439, Cl. 106-139.000.
Lefkow, Anthony R. T., to VAC-TEC Systems, Inc. Method and apparatus for evaporation arc stabilization for non-permeable targets utilizing permeable stop ring. 4,600,489, Cl. 204-192.00R.
Legrand: *See*—
Gosse, Marc; and Cheron, Jacques, 4,600,174, Cl. 248-72.000.
Lehman, Albert L.; and Finkl, Charles W., to A. Finkl & Sons Co. Method of ladle steelmaking and product produced thereby. 4,600,427, Cl. 75-49.000.
Lehr, Klaus; Hofmann, Bernhard; and Heymer, Gero, to Hoechst Aktiengesellschaft. Process for making manganese (II) salt solutions containing ammonium salt. 4,600,565, Cl. 423-50.000.
Leiber, Heinz, to Robert Bosch GmbH. Automotive vehicle anti-brake lock system. 4,600,244, Cl. 303-111.000.
Leisenring, Roger L., Jr.: *See*—
Virk, Kashmir S.; Caggiano, Michael A.; and Leisenring, Roger L., Jr., 4,600,562, Cl. 422-180.000.
Lelcuf, Jean: *See*—
Barraud, Andre ; and Lelcuf, Jean, 4,599,969, Cl. 118-429.000.
Lemone, Louis A.: *See*—
Gershenson, Edward; Lemone, Louis A.; and Faletra, Salvatore, 4,600,990, Cl. 364-200.000.
Lenhard-Backhaus, Hugo, to Steyr-Daimler-Puch Aktiengesellschaft. Vehicle. 4,600,068, Cl. 180-6.440.
Lenz, Hans P., to Robert Bosch GmbH. Method and apparatus to shield an air flow rate meter disposed in the intake tube of an internal combustion engine from air column fluctuations. 4,599,894, Cl. 73-118.000.
Lenz, James E.: *See*—
Egli, Werner H.; and Lenz, James E., 4,600,883, Cl. 324-207.000.
Leo, A. Frank, to DeSoto, Inc. Abrasion-resistant ultraviolet-curable coatings. 4,600,649, Cl. 428-412.000.
Leo Pharmaceutical Products Ltd. A/S (Lovens Kemiske Fabrik Produktionsaktieselkab): *See*—
Didriksen, Erik J., 4,600,577, Cl. 424-20.000.
Leonard, Michel: *See*—
Sciaky, Mario; Leonard, Michel; Jablonski, Pierre; and Marianne, Jean-Jacques, 4,600,136, Cl. 228-45.000.
Leorat, Francois; and Pannier, Gerard, to Regie Nationale des Usines Renault. Ratio change control in an automatic transmission with stepped ratios. 4,599,917, Cl. 74-866.000.
Lever Brothers Company: *See*—
Lloyd, John; and Rennie, George K., 4,600,620, Cl. 428-195.000.
Levine, Peter A., to RCA Corporation. Adaptive defect correction for solid-state imagers. 4,600,946, Cl. 358-163.000.
Lew, Hyok S.; and Elias, John W. Optically decorated baton. 4,600,974, Cl. 362-102.000.
Leyck, Sigurd: *See*—
Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, 4,600,722, Cl. 514-367.000.
Li, Tsung-Tee: *See*—
Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., 4,600,785, Cl. 549-212.000.
Liang, Chi-Dean; and Walsh, Gerald M., to G. D. Searle & Co. β-Adrenergic receptor agonist alkylaminoalkyl pyridinemethanol derivatives. 4,600,710, Cl. 514-357.000.
Libit, Sidney M. Squeeze pressure dispenser with integral siphon tube. 4,600,130, Cl. 222-209.000.
Libor, Oszkar; Nagy, Gabor; and Szekely, Tamas, to MTA Termeszettudomanyi Kutato Laboratoriumai. Process for the preparation of clay mineral-containing gels with stabilized structure and reversible water absorption ability. 4,600,744, Cl. 524-446.000.
Lienert, Gerold, to Rockwell International Corporation. Conveyor system for a shot peening machine. 4,599,879, Cl. 72-53.000.
Lifeing, Inc.: *See*—
Olschansky, Brad; and Olschansky, Scott, 4,600,189, Cl. 272-118.000.
Lilly Company, The: *See*—
Nelson, Ronald S.; and Loflin, John D., 4,600,598, Cl. 427-27.000.
Limca Research Inc.: *See*—
Doutre, Don A.; and Guthrie, Roderick I. L., 4,600,880, Cl. 324-71.100.
Lin, Ping-Wha. Continuous controlled process for removing sulphur oxides gases from stack gases. 4,600,570, Cl. 423-244.000.

Lin, Song-Ling; and Park, Moo-Kwang, to American Home Products Corporation. Aerosol anesthetic compositions. 4,600,575, Cl. 424-45.000.

Lin, Tai-Shun; and Prusoff, William H., to Research Corporation. Compositions and method for alleviating the toxic effects of 1,3-bis(2-chloroethyl)-1-nitrosourea. 4,600,573, Cl. 424-10.000.

Linde Aktiengesellschaft: *See—*
Kummann, Paul, 4,600,421, Cl. 62-25.000.
Seelman, Hans H., 4,599,855, Cl. 60-421.000.

Linder, Donald L.: *See—*
Carney, Scott N.; and Linder, Donald L., 4,601,061, Cl. 455-208.000.

Lindner, Adolf; and Linnau, Yendra, to Immuno Aktiengesellschaft fur Chemisch-Medizinische Produkte. Method of producing a tissue adhesive. 4,600,574, Cl. 424-28.000.

Lindner, Christian: *See—*
Zabrocki, Karl; Lindner, Christian; Muller, Friedmann; and Doring, Joachim, 4,600,747, Cl. 525-83.000.

Lindner, Georg H., to M&T Chemicals Inc. Method of producing transparent, haze-free tin oxide coatings. 4,600,654, Cl. 428-432.000.

Lindner, Otto; Pelster, Heinrich; Steffan, Guido; and Stuwe, Arnd, to Kramer Aktiengesellschaft. Sulphonation products of naphthalene, processes for their preparation, and their use. 4,600,542, Cl. 260-505.00C.

Linear Films, Inc.: *See—*
Hummel, John E.; and Baab, William E., 4,600,163, Cl. 242-96.000.

Ling, Hung C.; and Yan, Man F., to AT&T Technologies, Inc.; and Bell Telephone Laboratories, Inc. Ceramic compositions and devices. 4,600,967, Cl. 361-321.000.

Linkow, Leonard I. Osseous integrated submergible implant. 4,600,388, Cl. 433-176.000.

Linnau, Yendra: *See—*
Lindner, Adolf; and Linnau, Yendra, 4,600,574, Cl. 424-28.000.

Linwood, Gary C.; and Laragione, Robert, to AE/CDS Autoclave, Inc. Dual-powered pyrolysis probe driving circuit. 4,600,827, Cl. 219-492.000.

Lions, Noel: *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.

Lissalde, Francois; Bathelet, Pierre; Ferrieu, Bruno; and Brochier, Michel, to Crismatec. Machine for pulling monocrystals. 4,600,564, Cl. 422-249.000.

Liston, Max D.; Braig, James R.; Blackburn, Wayne; and Hsei, Paul, to Datascope Corporation. Water separator. 4,600,412, Cl. 55-189.000.

Litton Industries, Inc.: *See—*
Jensen, Homer, 4,600,886, Cl. 324-301.000.

Litton Systems, Inc.: *See—*
Stewart, Robert E., 4,599,896, Cl. 73-382.00R.

Litwin, Robert G.; Stone, Erwin R.; and Mitra, Asset K., to Mitra, Asset K. Coordinated floral arrangement assembly system and method. 4,600,612, Cl. 428-23.000.

Liu, Wentai, to Research Corporation. Architecture for two dimensional fast fourier transform. 4,601,006, Cl. 364-726.000.

Livermore, David G. H.: *See—*
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,600,772, Cl. 544-625.000.

Livnat, Aminadav: *See—*
Kafri, Oded; and Livnat, Aminadav, 4,600,304, Cl. 356-138.000.

Lloyd, John; and Rennie, George K., to Lever Brothers Company. Article suitable for wiping surfaces. 4,600,620, Cl. 428-195.000.

Lobsinger, James R.; Sweet, Steven R.; and Natter, Eckard F., to Allied Corporation. Automatic frequency control for radar receiver. 4,600,924, Cl. 343-17.10R.

Lockformer Company, The: *See—*
Rom, Rudolph A., 4,599,925, Cl. 83-56.000.

Lockheed Corporation: *See—*
Kalisz, John B., 4,600,171, Cl. 244-137.00A.
Wirt, Leslie S., 4,600,078, Cl. 181-286.000.

Loda, Michael A.: *See—*
Jero, John P.; Loda, Michael A.; and Slusarek, William L., 4,599,899, Cl. 73-584.000.

Lodge, Kevin J.; and Brettle, Jack, to Plessey Overseas Limited. Radar wave dipole of copper coated carbon fibers. 4,600,642, Cl. 428-367.000.

Lof Plastics Inc.: *See—*
Guy, Robert R., 4,600,461, Cl. 156-244.120.

Loflin, John D.: *See—*
Nelson, Ronald S.; and Loflin, John D., 4,600,598, Cl. 427-27.000.

Long, John D.: *See—*
Winter, David C.; and Long, John D., 4,600,060, Cl. 172-4.000.

Long, John V.: *See—*
Gagliani, John; and Long, John V., 4,600,770, Cl. 528-322.000.

Lonne, Klaus; Majewski, Klaus-Peter; and Zerfass, Hans-Rainer, to Goetze AG. Impregnated flat sealing gasket and method of making the same. 4,600,201, Cl. 277-1.000.

Lopez, Octavio. Intraocular lens inserting tool. 4,600,003, Cl. 128-303.00R.

Lopez, Osvaldo; and Horn, Gerald. Intraocular lens holder and inserter. 4,600,004, Cl. 128-303.00R.

Lopez, Ruben M. Electric stippler with lobed cam-disk drive. 4,599,799, Cl. 33-18.200.

Lopez, Rudy A.: *See—*
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.

Loth, John L. Retractable rounded trailing edge for circulation control wing. 4,600,172, Cl. 244-207.000.

Louis, Eckhart; Hechtl, Wolfgang; and Hefner, Heinz, to Wacker-Chemie GmbH. Paste composition containing an organopolysiloxane, platinum and filler. 4,600,731, Cl. 523-109.000.

Love, Gordon R.; and Millard, Richard J., to Sprague Electric Company. Solid electrolytic capacitor manufacture. 4,599,788, Cl. 29-570.000.

Lower, Hartmut: *See—*
Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, 4,600,632, Cl. 428-220.000.

Lubarsky, Daniel P., to Larse Corporation. Modulator-demodulator method and apparatus with efficient bandwidth utilization. 4,601,045, Cl. 375-38.000.

Lubrizol Corporation, The: *See—*
Higgins, William A., 4,600,742, Cl. 524-166.000.

Lucas Industries: *See—*
Ankrett, Dennis R., 4,600,608, Cl. 427-424.000.

Luccarelli, Domenick, Jr.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,600,576, Cl. 424-49.000.

Lucidyne, Inc.: *See—*
Santamaria, George T., 4,600,411, Cl. 55-139.000.

Ludwig Heumann & Co., GmbH: *See—*
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.

Ludwigs, Hermann, to Kabel- und Gummiwerke, Aktiengesellschaft abgekurzt; "Kabelwerk Eupen", Manufactures de Cables Electrique et de Caoutchouc, Societe Anonyme, en abrege ; and "Cablerie d'Eupen", Aktiengesellschaft. Apparatus for producing a cable conduit system suitable for the drawing-in of cables. 4,600,176, Cl. 254-134.3FT.

Luebbers, Willi, to Nico-Pyrotechnik Hanns-Juergen Diederichs GmbH & Co., KG. Ignition device. 4,599,946, Cl. 102-274.000.

Lugli, Gabriele: *See—*
Pedretti, Ugo; Perego, Giovanni; and Lugli, Gabriele, 4,600,756, Cl. 526-134.000.

Lukco, Dorothy: *See—*
Basalyk, Peter I.; Lukco, Dorothy; Mooney, J. Robert; and Seifert, Dexter C., 4,600,443, Cl. 134-3.000.

Lukens General Industries, Inc.: *See—*
Behnke, Thomas L., 4,599,922, Cl. 82-1.00C.

Lundie, William R.; and Olson, Jay H., to Deere & Company. Seed meter disk for use with sunflower and other seeds of long, slender shape. 4,600,122, Cl. 221-211.000.

Lundstrom, Rene , to Svenska AB Ivers Lee. Method and a machine for packing sliced products in a container to be vacuum sealed. 4,599,849, Cl. 53-427.000.

Luoni, Marco. Automatic device for the drawing of bundles of welded bags of plastic material and for the insertion thereof into container means. 4,599,845, Cl. 53-251.000.

Lutjens, Robert D.; and Zarate, Robert A., to Cryomec, Incorporated. Vaporization system. 4,599,868, Cl. 62-53.000.

Lux, Karl-Heinz: *See—*
Barlian, Reinhold; Fischle, Martin; and Lux, Karl-Heinz, 4,600,977, Cl. 362-362.000.

Lymn, Peter A. P. Solder leveller. 4,599,966, Cl. 118-63.000.

Lynch, Franklin E.: *See—*
Baker, Nathaniel R.; and Lynch, Franklin E., 4,600,525, Cl. 252-184.000.

M.A.N. - Roland Druckmaschinen Aktiengesellschaft: *See—*
Kobler, Ingo, 4,599,943, Cl. 101-217.000.

M&T Chemicals Inc.: *See—*
Lindner, Georg H., 4,600,654, Cl. 428-432.000.

MacDermid, Incorporated: *See—*
Leever, Harold; and Slominski, Leo J., 4,600,609, Cl. 427-438.000.

Machonis, John, Jr.: *See—*
Schmukler, Seymour; Shida, Mitsuzo; and Machonis, John, Jr., 4,600,746, Cl. 525-57.000.

Macier, James E.: *See—*
Breckenfeld, Paul W.; Broughton, George L.; Calamia, David C.; and Macier, James E., 4,599,979, Cl. 123-73.0AD.

MacIntyre, Hazen L., to Hazenlite Incorporated. Emergency lighting apparatus. 4,600,972, Cl. 362-20.000.

MacKeighen, Harold R.; and Cortesi, Vincent T., to Alfred D. Lobo Co., L.P.A. Elastomer compositions containing humates. 4,600,728, Cl. 521-84.100.

Madurski, Walter. Portable barbecue. 4,599,988, Cl. 126-9.00R.

Maeda, Junichi: *See—*
Okamoto, Tsugio; and Maeda, Junichi, 4,600,325, Cl. 400-208.000.

Maertens, Luc: *See—*
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, 4,600,338, Cl. 405-74.000.

Magaha, George H., Jr., to Economy Distributors, Inc. Ceiling panel security clip device. 4,599,831, Cl. 52-98.000.

Magnetic Activated Particle Sorting, Inc.: *See—*
Schwartz, Abraham, 4,600,389, Cl. 433-217.100.

Mahant-Shetti, Shivaling S.: *See—*
Shah, Ashwin H.; Gallia, James D.; Wang, I-Fay; and Mahant-Shetti, Shivaling S., 4,601,019, Cl. 365-200.000.

Mahle GmbH: *See—*
Ellermann, Jurgen; and Pfeiffenberger, Horst, 4,599,935, Cl. 92-159.000.

Maida, Osamu; and Katayama, Akira, to Nippon Kogaku K. K. Aperture control system for cameras. 4,600,289, Cl. 354-448.000.
Maihos, Michael G. Foldable knife holder. 4,600,133, Cl. 224-232.000.
Maijer, Rolf: *See—*
Smith, Dennis C.; and Maijer, Rolf, 4,600,383, Cl. 433-9.000.
Mainzer, Stanley E.: *See—*
Kindle, Karen L.; Mainzer, Stanley E.; Marlatt, Deborah L.; and Sawyer, Constance B., 4,600,693, Cl. 435-176.000.
Mair, Alexander D.; and Soroczak, Myra M., to Tennessee Valley Authority. Single float step phosphate ore beneficiation. 4,600,505, Cl. 209-9.000.
Mairs, Darra A.: *See—*
Mairs, Robert W., III; and Mairs, Darra A., 4,599,754, Cl. 5-418.000.
Mairs, Robert W., III; and Mairs, Darra A. Combination wind screen and beach blanket apparatus. 4,599,754, Cl. 5-418.000.
Majewski, Klaus-Peter: *See—*
Lonne, Klaus; Majewski, Klaus-Peter; and Zerfass, Hans-Rainer, 4,600,201, Cl. 277-1.000.
Makita Electric Works, Ltd.: *See—*
Mukoyama, Kenji, 4,600,135, Cl. 227-120.000.
Makita, Masaru, to Canon Kabushiki Kaisha. Display device for producing overlapped display of character patterns. 4,600,920, Cl. 340-735.000.
Mallinckrodt, Inc.: *See—*
Salpekar, Anil M.; Freebersyser, Steven R.; and Robinson, Douglas A., 4,600,579, Cl. 424-80.000.
Mallory, Peter E.: *See—*
Halpern, Peter H.; Mallory, Peter E.; Haug, Paul E.; and Koos, William M., Jr., 4,601,046, Cl. 375-38.000.
Malpas, Jon H.; and Calder, Alan R. Dispensing taps. 4,600,127, Cl. 222-83.000.
Malta, Jacob H. Handchime with elastomeric hinge. 4,599,932, Cl. 84-404.000.
Mammino, Joseph: *See—*
Hoffend, Thomas R.; and Mammino, Joseph, 4,600,677, Cl. 430-108.000.
Mankey, Harry S.: *See—*
Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., 4,600,069, Cl. 180-24.020.
Mann, David O., to La-Man Corporation. Air line vapor trap. 4,600,416, Cl. 55-323.000.
Mannesmann Aktiengesellschaft: *See—*
Muller, Norbert, 4,601,041, Cl. 373-72.000.
Mannucci, Ivo: *See—*
Falco, Giulio; and Mannucci, Ivo, 4,600,181, Cl. 266-102.000.
Manson, Earle L., Jr.: *See—*
Hong, Jauwhei; Jens, Richard A.; Shen, Steve S.; and Manson, Earle L., Jr., 4,600,659, Cl. 428-471.000.
Manufacturing Administrations Management Systems, Inc.: *See—*
Cunniff, William B.; and Tyler, Walter, 4,600,814, Cl. 179-18.0BC.
Marcandalli, Ulderico, to Rockwell-Rimoldi S.p.A. Looper actuating device for sewing machines. 4,599,957, Cl. 112-199.000.
Marchais, Jean-Claude: *See—*
Tzifkansky, Guy; and Marchais, Jean-Claude, 4,600,117, Cl. 220-366.000.
Marcucci, Rudolph V.: *See—*
Bouchard, Andre C.; Thibault, Paul A.; and Marcucci, Rudolph V., 4,600,856, Cl. 313-25.000.
Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of aromatic compounds which contain perfluorinated side-chains bonded via a heteroatom. 4,600,787, Cl. 549-362.000.
Marianne, Jean-Jacques: *See—*
Sciaky, Mario; Leonard, Michel; Jablonski, Pierre; and Marianne, Jean-Jacques, 4,600,136, Cl. 228-45.000.
Mark, Rolf-Peter: *See—*
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.
Marker International Company: *See—*
Knabel, Walter, 4,600,212, Cl. 280-611.000.
Sedlmair, Gerhard; and Knabel, Walter, 4,600,213, Cl. 280-618.000.
Marks, Eugene A.; and Peters, Arthur J., to Bourns Instruments, Inc. Diaphragm pressure sensor with improved tensile loading characteristics. 4,600,912, Cl. 338-42.000.
Marlatt, Deborah L.: *See—*
Kindle, Karen L.; Mainzer, Stanley E.; Marlatt, Deborah L.; and Sawyer, Constance B., 4,600,693, Cl. 435-176.000.
Marley-Wylain Company, The: *See—*
Atkins, Donald G., 4,600,844, Cl. 307-118.000.
Marotel, Gerard: *See—*
Renoult, Patrick; and Marotel, Gerard, 4,600,900, Cl. 331-116.00R.
Marpac Industries, Inc.: *See—*
Williams, Brian L., 4,599,851, Cl. 53-471.000.
Marsland, George H.: *See—*
Latzko, Richard I.; Marsland, George H.; and Reuteler, Johann F., 4,599,769, Cl. 29-26.00A.
Martin, Anthony N., to United Technologies Corporation. Dual controller position control system. 4,600,870, Cl. 318-610.000.
Martin, Frank W.; and Shahbazi, Samson, to Rohm and Haas Company. Low resistance resistor compositions. 4,600,602, Cl. 427-96.000.
Martin, Gerald D. Ferrule dispenser. 4,600,118, Cl. 221-1.000.
Martin, James E. Fishing lure. 4,599,821, Cl. 43-42.460.
Martin, Ralph E.: *See—*
Segredo, Anthony F.; Prendergast, Richard E.; Martin, Ralph E.; and Pluister, Jack W., 4,600,347, Cl. 413-26.000.
Martin, Tellis A.: *See—*
Dolak, Terence M.; and Martin, Tellis A., 4,600,758, Cl. 546-200.000.
Martinez, Francisco J.: *See—*
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.
Martinez, Nelson P.: *See—*
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., 4,600,703, Cl. 502-210.000.
Marttila, Andrew R. Compound internal combustion and external combustion engine. 4,599,863, Cl. 60-616.000.
Marui, Kuniyoshi: *See—*
Tatsumi, Kaoru; Kishida, Takao; Marui, Kuniyoshi; and Ishii, Takaaki, 4,600,809, Cl. 179-2.0EA.
Marvin Glass & Associates: *See—*
Rosenwinkel, Donald A.; and Disko, Harry, 4,600,393, Cl. 434-88.000.
Maryyanek, Richard D.; and Zdrok, Joseph Z., to American Optical Corporation. Disposable respirator. 4,600,002, Cl. 128-206.190.
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., to AT&T Bell Laboratories; and AT&T Information Systems. Data communication method and circuitry. 4,601,035, Cl. 371-32.000.
Maschinenfabrik Wifag: *See—*
von Hein, Eduard; and Tibor, Ertavi, 4,600,186, Cl. 271-182.000.
Mason, Arthur C.: *See—*
Brems, John H.; and Mason, Arthur C., 4,600,095, Cl. 198-346.200.
Massachusetts Institute of Technology: *See—*
Alei, Philip E.; and Suh, Nam P., 4,600,631, Cl. 428-212.000.
Garber, Edward M., 4,600,852, Cl. 310-313.00B.
Massie, James E.: *See—*
Spain, Raymond G.; and Massie, James E., 4,600,457, Cl. 156-158.000.
Mast, Gary C.: *See—*
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,599,891, Cl. 73-38.000.
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Parallel analog-to-digital converter circuit. 4,600,916, Cl. 340-347.0AD.
Masuda, Isao: *See—*
Arita, Kazuhiro; Masuda, Isao; and Sano, Yasuo, 4,600,766, Cl. 528-207.000.
Masuda, Yoshihiro: *See—*
Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, 4,600,287, Cl. 354-299.000.
Masuda, Yoshinori: *See—*
Furuhata, Takashi; Nakama, Taihei; and Masuda, Yoshinori, 4,600,953, Cl. 360-10.300.
Matenar, Gerd: *See—*
von Bonin, Wulf; and Matenar, Gerd, 4,600,734, Cl. 523-179.000.
Materazzi, Nicola, to Ferrari Societa' per Azioni Esercizio Fabbriche Automobili e Corse. Inlet manifold for normal induction or supercharged internal combustion engines featuring indirect fuel injection. 4,599,977, Cl. 123-52.00M.
Matex Co., Ltd.: *See—*
Matoba, Hideyasu, 4,600,158, Cl. 241-243.000.
Matoba, Hideyasu, to Matex Co., Ltd. Runner chopper. 4,600,158, Cl. 241-243.000.
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, to Sumitomo Metal Industries, Ltd. Process for controlling the molten metal level in continuous thin slab casting. 4,600,047, Cl. 164-453.000.
Matsubara, Akitoshi: *See—*
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki, 4,600,676, Cl. 430-106.600.
Matsuda, Hiroyuki: *See—*
Yamamoto, Shizuo; Kanda, Tetsuo; Suzuki, Nobuaki; and Matsuda, Hiroyuki, 4,600,076, Cl. 181-233.000.
Matsuhisa, Yohji: *See—*
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,600,572, Cl. 423-447.200.
Matsui, Minoru; and Soma, Takao, to NGK Insulators, Ltd. Engine part. 4,600,038, Cl. 138-140.000.
Matsui, Shigetomo: *See—*
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,600,219, Cl. 285-55.000.
Matsui, Susumu; Yoshihama, Yoshio; and Taniguchi, Tsutomu, to Takara Shuzo Co., Ltd. Novel bilirubin oxidase, its production and use. 4,600,689, Cl. 435-25.000.
Matsui, Toshiro: *See—*
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.
Matsumori, Shigemitsu, to NEC Corporation. Print thimble recognizing system for a serial printer. 4,600,324, Cl. 400-144.100.
Matsumoto, Takuji: *See—*
Fujimoto, Shigeru; Ohte, Satoshi; Kondo, Hirofumi; Matsumoto, Takuji; and Fujita, Takafumi, 4,599,834, Cl. 52-167.000.

Matsunaga, Chiharu: *See*—
Araki, Hideo; and Matsunaga, Chiharu, 4,599,856, Cl. 60-421.000.

Matsunaga, Toru: *See*—
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, 4,600,540, Cl. 558-255.000.

Matsuo, Junichi: *See*—
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,600,648, Cl. 428-412.000.

Matsuo, Kenji: *See*—
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,600,916, Cl. 340-347.0AD.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honsho, Norihisa; and Mori, Kazuhiro, 4,600,375, Cl. 425-174.400.
Igata, Kouichi; Deguchi, Yoshihiro; and Kobayashi, Masaaki, 4,600,952, Cl. 360-10.300.
Ishimura, Yozo, 4,600,826, Cl. 219-492.000.
Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, 4,600,862, Cl. 315-358.000.
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.
Uya, Masaru; and Kaneko, Katsuyuki, 4,601,007, Cl. 364-784.000.

Matsushita Electronics Corp.: *See*—
Iwasaki, Katsuyo; Konosu, Osamu; Kihara, Atsushi; and Kamada, Masayasu, 4,600,858, Cl. 313-413.000.

Matsushita, Machiko: *See*—
Kohayakawa, Yoshimi; and Matsushita, Machiko, 4,600,012, Cl. 128-665.000.

Matsuura, Osamu: *See*—
Sekiya, Tsuneto; Matsuura, Osamu; and Huruhata, Shooichi, 4,600,968, Cl. 361-394.000.

Mattei, Riccardo; and Belvederi, Bruno, to G.D Societa' per Azioni. Dual-rod cigarette manufacturing machine. 4,600,020, Cl. 131-84.400.

Mattei, Riccardo, to G. D. Societa' per Azioni. Method for separating tobacco particles on cigarette manufacturing machines. 4,600,021, Cl. 131-110.000.

Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., to Brudi Equipment, Inc. Method and apparatus for handling container chassis. 4,600,350, Cl. 414-267.000.

Mattison, Allen H., to Cambridge Filter Corporation. High efficiency, down flow air filter sealing and support system. 4,600,419, Cl. 55-484.000.

Maurer, Richard P.; and Holtrop, James S., to Monsanto Company. Thermoformable polymeric foam headliners. 4,600,621, Cl. 428-121.000.

Maynard, James H.: *See*—
Paul, Byron G.; Maynard, James H.; and Dalrymple, John C., 4,601,021, Cl. 364-521.000.

Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., to RCA Corporation. Method for etching small-ratio apertures into a strip of carbon steel. 4,600,470, Cl. 156-644.000.

Maynard, Walter P., Jr. Liquid funnel and pouring spout combination. 4,600,125, Cl. 222-81.000.

Mayo, Howard A., Jr., to Allis-Chalmers Corporation. Adjustable draft tube. 4,599,854, Cl. 60-398.000.

Mazzorana, Alfred B.; and Froment, Francis, to Societe Paris-Rhone. Brush-holder for disc commutator of rotating electric machines. 4,600,850, Cl. 310-242.000.

McBride, Thomas D. Non-slip resilient ladder support. 4,600,079, Cl. 182-108.000.

McBroom, Chester L. Corn cob saver sieve for combines. 4,600,019, Cl. 130-27.00Z.

MCC Corporation: *See*—
Yokoyama, Takashi, 4,599,795, Cl. 30-188.000.

McCarroll, John J.; Tennison, Stephen R.; and Wilkinson, Nicholas P., to British Petroleum Company p.l.c., The. Catalysts and their use in ammonia production. 4,600,571, Cl. 423-363.000.

McCormick, Ronald F.: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., 4,600,451, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,452, Cl. 149-19.300.

McDermott, Noel C., to Larus Corporation. Attenuator adapted for clip mounting to connecting block terminals. 4,600,816, Cl. 179-190.000.

McDonald, John J., to Britt Corporation. Pulsed laser system. 4,601,037, Cl. 372-25.000.

McGary, Charles W.: *See*—
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., 4,600,652, Cl. 428-423.300.

McHale, William D., to Mobil Oil Corporation. Regeneration of platinum-containing zeolite catalysts which includes oxidation of coke in the presence of water. 4,600,700, Cl. 502-50.000.

McKenna, John F., Jr., to Charles Stark Draper Laboratory, Inc., The. Fault-tolerant clock system. 4,600,845, Cl. 307-269.000.

McKimmy, Dirk E.: *See*—
Gillman, Tommie D.; and McKimmy, Dirk E., 4,600,376, Cl. 425-346.000.

McLeod, Shirley. Carryall handbag and mat and method of making same. 4,600,091, Cl. 190-2.000.

McMurray, Wade G. Tandem trailer dolly. 4,600,210, Cl. 280-408.000.

McNally, Mark J.: *See*—
Krohn, William T.; McNally, Mark J.; and Abreu, Rene, 4,600,307, Cl. 356-346.000.

MDC Max Datwyler Bleienbach AG: *See*—
Datwyler, Max, 4,599,944, Cl. 101-378.000.

Mead Corporation, The: *See*—
Adair, Paul C.; and Burkholder, Amy L., 4,600,678, Cl. 430-138.000.
Milliens, Andre , 4,600,140, Cl. 229-48.00R.

Mead Johnson & Company: *See*—
Dolak, Terence M.; and Martin, Tellis A., 4,600,758, Cl. 546-200.000.

Mechanical Enterprises, Inc.: *See*—
Twyford, Robert H., 4,600,819, Cl. 200-16.00A.

Med-Safe Systems, Inc.: *See*—
Shillington, Richard A.; and Oberschmidt, Alec, 4,600,112, Cl. 215-274.000.

Meddaugh, Samuel A.: *See*—
Hedin, Raymond C.; Meddaugh, Samuel A.; and Torok, Ernest J., 4,600,270, Cl. 350-162.170.

Medex, Inc.: *See*—
Strachan, J. Scott, 4,600,855, Cl. 310-338.000.

Medtronic, Inc.: *See*—
Fogt, Eric J., 4,600,495, Cl. 204-409.000.

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Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
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Meier, Hans-Joachim, to Deutsche Babcock Werke Aktiengesellschaft. Combustion chamber. 4,599,952, Cl. 110-216.000.

Meinert, Heinz, to Pauwels-Trafo Belgium N.V. Elliptically shaped magnetic core. 4,600,911, Cl. 336-212.000.

Meisel, Karlheinrich; and Raue, Roderich, to Bayer Aktiengesellschaft. Cationic enamine dyestuff indolylmethine derivatives. 4,600,776, Cl. 544-198.000.

Melcher, Randy. Self-storing window assembly. 4,599,836, Cl. 52-202.000.

Mengel, Peter: *See*—
Doemens, Guenter; and Mengel, Peter, 4,600,878, Cl. 324-51.000.

Mengel, Ronald E.; and Seipel, Thomas E., to Oscar Mayer Foods Corporation. Chopper blade assembly. 4,600,160, Cl. 241-282.200.

Menzel, Hartmut: *See*—
Eck, Herbert; Menzel, Hartmut; Jira, Reinhard; and Prasse, Alfred, 4,600,790, Cl. 556-421.000.

Merck & Co., Inc.: *See*—
Chaiet, Louis; Monaghan, Richard L.; Zimmerman, Sheldon B.; and Fernandez, Maria I. M., 4,600,691, Cl. 435-106.000.
Christensen, Burton G.; and Shih, David H., 4,600,713, Cl. 514-210.000.

Merck Patent Gesellschaft mit Beschrankter Haftung: *See*—
Eidenschink, Rudolf; and Weber, Georg, 4,600,528, Cl. 252-299.610.

Merix Corporation: *See*—
Mix, Thomas W., 4,600,544, Cl. 261-79.00A.

Merrick's, Inc.: *See*—
Vitcenda, Marie A.; and Zmolek, Alfred J., 4,600,585, Cl. 426-2.000.

Merritt, William. Hollow bat. 4,600,193, Cl. 273-72.00A.

Meshreki, Makram H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,600,740, Cl. 524-120.000.

Metcalfe, Arthur G.; Napier, James C.; and Compton, William A., to Solar Turbines Incorporated. Apparatus for removing contaminants from heated gases. 4,600,414, Cl. 55-290.000.

Methane Drainage Ventures: *See*—
Richards, Walter L., 4,600,061, Cl. 175-62.000.

Metronic Electronic GmbH: *See*—
Bucher, Heinz, 4,599,997, Cl. 128-36.000.

Meuffels, Paul: *See*—
Klatt, Karl-Heinz; Wenzl, Helmut; and Meuffels, Paul, 4,600,660, Cl. 428-607.000.

Meunier, Jean-Paul: *See*—
Kafka, Bernard; Meunier, Jean-Paul; and Have, Serge, 4,600,637, Cl. 428-318.400.

Meuret, Paul V., to Societe a Responsabilite Limitee Datome. Reciprocating rotary piston thermal engine with a spherical chamber. 4,599,976, Cl. 123-18.00A.

Meyer, Gerhard: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Meyer, Joseph; and Vinton, David J., to U.S. Philips Corporation. Method of forming a resist mask resistant to plasma etching. 4,600,686, Cl. 430-326.000.

Meyer, Robert G.: *See*—
Santos, Joseph T.; and Meyer, Robert G., 4,600,898, Cl. 331-116.0FE.

Meyer, Rolf-Volker; Dhein, Rolf; Brassat, Bert; and Hagemann, Hermann, to Bayer Aktiengesellschaft. Easy-flowing impact-resistant

polyamide modified with oxycarbonyl isocyanate. 4,600,752, Cl. 525-424.000.

Mezo, Imre: *See*—
Seprodi, Janos; Teplan, Istvan; Mezo, Imre; and Erchegyi, Judit, 4,600,705, Cl. 514-15.000.

Michaelson, Wayne A.: *See*—
Scheuneman, James H.; and Michaelson, Wayne A., 4,600,986, Cl. 364-200.000.

Michler, James R., to Consolidated Papers, Inc. Apparatus for separating rolls which are interconnected end-to-end. 4,599,777, Cl. 29-239.000.

Middleton, Francisco A.: *See*—
Hargrave, Franklin; and Middleton, Francisco A., 4,601,029, Cl. 370-67.000.

Mikata, Yoshitaka: *See*—
Yamano, Shoji; Mikata, Yoshitaka; Higuchi, Tadashi; and Nishide, Kazuhiro, 4,600,096, Cl. 198-505.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Miyano, Takashi; and Takahashi, Shunji, 4,599,981, Cl. 123-361.000.

Millard, Richard J.: *See*—
Love, Gordon R.; and Millard, Richard J., 4,599,788, Cl. 29-570.000.

Miller Brewing Company: *See*—
Horton, James P.; Cebe, Jerry F.; Hagemes, Dave; and Jeter, Lewis M., 4,599,991, Cl. 126-345.000.

Miller, E. K., to Sundstrand Corporation. Thrust bearing and seal assembly. 4,600,318, Cl. 384-130.000.

Miller, Jim; Humphries, Jim; and Teel, Toby, to Equipment Renewal Company. Tubing hanger assembly. 4,600,054, Cl. 166-75.100.

Miller, Kevin P.: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,600,576, Cl. 424-49.000.

Miller, Michael A.: *See*—
Dabringhaus, Gustav, deceased; Dabringhaus, Vera, personal representative; and Miller, Michael A., 4,600,342, Cl. 409-227.000.

Miller, Walter; and Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Slit-type sealing arrangement for encapsulated measuring system. 4,600,203, Cl. 277-237.00R.

Miller, William R.: *See*—
Fisher, Kenneth J.; and Miller, William R., 4,600,979, Cl. 362-373.000.

Milliens, Andre , to Mead Corporation, The. Interlock between panels. 4,600,140, Cl. 229-48.00R.

Milosevic, Dragan: *See*—
Fukuta, Norihiko; and Milosevic, Dragan, 4,600,147, Cl. 239-14.000.

Minamida, Katsuhiro: *See*—
Sato, Takashi; Ozawa, Tsutomu; and Minamida, Katsuhiro, 4,600,048, Cl. 164-463.000.

Minardi, Maurice. Separation of molded parts from connectors. 4,600,106, Cl. 209-662.000.

Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, to Asahi Kasej Kogyo Kabushiki Kaisha. Thermoplastic elastomers. 4,600,749, Cl. 525-314.000.

Miner, Robert M. Pipe end area cleaning system. 4,600,444, Cl. 134-8.000.

Ministry of International Trade & Industry: *See*—
Torisaka, Yasunori; Ohuchi, Kiyoyuki; and Nakazawa, Yoshinori, 4,600,446, Cl. 148-2.000.

Minnesota Mining and Manufacturing Company: *See*—
Drahnak, Timothy J., 4,600,484, Cl. 204-157.740.
Hendrickson, William A.; Evans, Jack L.; Paulson, Kenneth R.; and Wilson, Robert W., 4,600,673, Cl. 430-66.000.
Koshar, Robert J., 4,600,774, Cl. 544-85.000.
Landsman, Stephen P., 4,600,895, Cl. 331-1.00A.
Langer, Roger L., 4,600,634, Cl. 428-220.000.

Minolta Camera Kabushiki Kaisha: *See*—
Iwasa, Eiji; and Ito, Noboru, 4,600,675, Cl. 430-106.600.

Misaka, Yoshisuke: *See*—
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, 4,600,047, Cl. 164-453.000.

Mischutin, Vladimir, to White Chemical Corporation. Process for rendering non-thermoplastic fibrous materials flame resistant to molten materials by application thereto of a flame resistant composition, and related articles and compositions. 4,600,606, Cl. 427-389.000.

Miszkowski, Nancy A.: *See*—
White, Lawrence K.; and Miszkowski, Nancy A., 4,600,597, Cl. 427-9.000.

Mita Industrial Co., Ltd.: *See*—
Nakazawa, Toru, 4,600,668, Cl. 430-31.000.

Mitchell, John D.: *See*—
Ng, Yee S.; Contois, Lawrence E.; Mitchell, John D.; and Walling, James D., 4,600,669, Cl. 430-47.000.

Mitchell, Porter H.: *See*—
Allan, Barry D.; and Mitchell, Porter H., 4,600,453, Cl. 149-36.000.

Mitchell, Steven C. Combination interlocking cap for sports' helmet. 4,599,752, Cl. 2-425.000.

Mitra, Asset K.: *See*—
Litwin, Robert G.; Stone, Erwin R.; and Mitra, Asset K., 4,600,612, Cl. 428-23.000.

Mitsubishi Chemical Industries: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Fukumoto, Takaaki; Hama, Masaharu; and Kayano, Shinpei, 4,600,888, Cl. 324-439.000.
Shibata, Hiroshi; Toyoda, Hiroyasu; and Nakata, Hidefumi, 4,600,833, Cl. 250-216.000.
Tsuji, Shintaro, 4,600,087, Cl. 187-29.00R.
Yamasaki, Shinji; Sugiyama, Yoshiki; Tangiku, Itsurou; and Iida, Yasumasa, 4,600,086, Cl. 187-27.000.
Yonemoto, Masashi, 4,600,088, Cl. 187-29.00R.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.

Mitsubishi Mining & Cement Co., Ltd.: *See*—
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Emoto, Kazuhiro; and Itoh, Akira, 4,600,674, Cl. 430-72.000.

Mitsuhashi, Wataru; Kaminaka, Kouji; and Kotani, Kaname, to Nippon Air Brake Co., Ltd. Device for automatically opening and closing hinged door. 4,599,824, Cl. 49-141.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Fukui, Kunisuke; and Kashiwa, Norio, 4,600,762, Cl. 526-348.600.

Mitsui Toatsu Chemicals Inc.: *See*—
Takagi, Kaneyuki; Kawai, Yoichi; and Kamiya, Yoshiyasu, 4,600,748, Cl. 525-133.000.

Miura, Junji: *See*—
Kizu, Shuji; Ishida, Tsuyoshi; Hiramatsu, Kenichi; and Miura, Junji, 4,600,843, Cl. 250-578.000.

Mix, Thomas W., to Merix Corporation. Packing unit and method of making. 4,600,544, Cl. 261-79.00A.

Miyake, Takehito: *See*—
Fujii, Hideichi; Miyake, Takehito; and Konishi, Hiromu, 4,600,241, Cl. 297-457.000.

Miyano, Takashi; and Takahashi, Shunji, to Mikuni Kogyo Kabushiki Kaisha. Method of controlling air-fuel ratio of an engine. 4,599,981, Cl. 123-361.000.

Miyasaka, Kenji: *See*—
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,600,633, Cl. 428-220.000.

Miyoshi, Takahito: *See*—
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,600,638, Cl. 428-323.000.

Mizutani, Akihiko; Murayama, Hiroyoshi; Arakawa, Kohsaku; and Tanaka, Saburo, to Hakuto Chemical Co., Ltd. Composition for the clarification and detackification of paint spray booth wastes. 4,600,513, Cl. 210-712.000.

Mobil Oil Corporation: *See*—
Angevine, Philip J.; Degnan, Thomas F., Jr.; and Landis, Michael E., 4,600,503, Cl. 208-251.00H.
Baldwin, Willett F.; and Shen, Liang C., 4,600,887, Cl. 324-333.000.
Bowman, Bonita F., 4,601,023, Cl. 367-65.000.
Bridger, Robert F., 4,600,543, Cl. 558-133.000.
Doner, John P.; Horodysky, Andrew G.; and Keller, John A., Jr., 4,600,517, Cl. 252-32.70E.
Horodysky, Andrew G., 4,600,520, Cl. 252-49.600.
McHale, William D., 4,600,700, Cl. 502-50.000.

Mochizuki, Hirohiko; Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, to Fujitsu Limited. Semiconductor memory device having active pull-up circuits. 4,601,017, Cl. 365-189.000.

Mocker, Hans W.: *See*—
Faxvog, Frederick R.; and Mocker, Hans W., 4,601,036, Cl. 372-20.000.

Modine Manufacturing: *See*—
Wehrman, James L., 4,600,051, Cl. 165-149.000.

Moerke, Delford A. Arc welding system and docking assembly therefor. 4,600,824, Cl. 219-137.630.

Mogensen, Gregers E., to Aktieselskabet Nordiske Kabel- og Traadfabriker. Method in the signal processing of a received train of pulses, and a receiver for carrying out the process. 4,600,303, Cl. 356-73.100.

Mohler, Rick L.: *See*—
Horr, Robert A.; and Mohler, Rick L., 4,600,445, Cl. 148-1.500.

Mohr, Dieter, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum for use as printing plate supports, in an aqueous mixed electrolyte. 4,600,482, Cl. 204-129.400.

Moisinovich, Ljudmila I.: *See*—
Stepanenko, Alexandr V.; Isaevich, Leonid A.; and Moisinovich, Ljudmila I., 4,599,880, Cl. 72-94.000.

Molinier S. A.: *See*—
Delannoy, Robert G., 4,600,465, Cl. 156-351.000.

Moll, Richard J. Apparatus for detecting and actuating the feeding of paper in paper folding machines. 4,600,185, Cl. 270-58.000.

Molnar, Karl: *See*—
Ozin, Geoffrey A.; and Molnar, Karl, 4,599,869, Cl. 62-55.500.

Momata, Kazuhiro: *See*—
Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Momata, Kazuhiro; and Arai, Shinichi, 4,600,965, Cl. 361-153.000.

Monaghan, Richard L.: *See*—
Chaiet, Louis; Monaghan, Richard L.; Zimmerman, Sheldon B.; and Fernandez, Maria I. M., 4,600,691, Cl. 435-106.000.

Monash University: *See*—
Short, Roger V.; and Armstrong, Stuart, 4,600,723, Cl. 514-416.000.
Monsanto Company: *See*—
Alt, Gerhard H., 4,600,433, Cl. 71-118.000.
Bromley, James E.; Chamberlin, John M.; and Yu, Jing-peir, 4,600,644, Cl. 428-399.000.
Dyroff, David R.; Burke, Edward J.; Vanderlinde, William; and Backes, Thomas W., 4,600,750, Cl. 525-398.000.
Maurer, Richard P.; and Holtrop, James S., 4,600,621, Cl. 428-121.000.
Schumacher, Ignatius, 4,600,702, Cl. 502-200.000.
Montabert, Roger, to Etablissements Montaberg, Societe Anonyme. Electrohydraulic control system for a rockdrill assembly. 4,601,000, Cl. 364-513.000.
Monte, Salvatore J.: *See*—
Sugerman, Gerald; and Monte, Salvatore J., 4,600,789, Cl. 556-17.000.
Montecatini Edison S.p.A.: *See*—
Galli, Paolo; and Parrini, Paolo, 4,600,545, Cl. 264-11.000.
Montgomery, John A.: *See*—
Temple, Carroll G.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,600,716, Cl. 514-249.000.
Montgomery, Robert W.: *See*—
Reynold, Timothy; Montgomery, Robert W.; Swaby, Harold; and Garner, Henry C., 4,601,042, Cl. 373-93.000.
Mooney, J. Robert: *See*—
Basalyk, Peter I.; Lukco, Dorothy; Mooney, J. Robert; and Seifert, Dexter C., 4,600,443, Cl. 134-3.000.
Moos, David P.: *See*—
Alitz, Orville J.; and Moos, David P., 4,600,925, Cl. 343-5.0SA.
Morales, Alfredo L.; Guillen, Jose A. S.; de Agudelo, Magdalena M.; Martinez, Nelson P.; and Carrasquel, Angel R., to Intevep, S.A. Catalyst for the hydrocracking of heavy vacuum gas oils, method of preparation of catalyst and process for use thereof in the mild hydrocracking of heavy vacuum gas oils. 4,600,703, Cl. 502-210.000.
Morgan, Charles R.: *See*—
Browne, Alan R.; and Morgan, Charles R., 4,600,679, Cl. 430-162.000.
Mori, Daisuke: *See*—
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.
Mori, Kazuhiro: *See*—
Honsho, Norihisa; and Mori, Kazuhiro, 4,600,375, Cl. 425-174.400.
Mori, Kei. Light source device. 4,600,973, Cl. 362-32.000.
Mori, Sanae, to Daido Metal Company Ltd. Pad type journal bearing device with a constant bearing clearance. 4,600,317, Cl. 384-117.000.
Mori, Shoichi: *See*—
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,600,633, Cl. 428-220.000.
Mori, Yasuharu: *See*—
Tokuno, Masateru; and Mori, Yasuharu, 4,600,841, Cl. 250-548.000.
Morimoto, Seiichi: *See*—
Higashi, Takehiro; Kobori, Michio; Yoshino, Zenichi; and Morimoto, Seiichi, 4,600,477, Cl. 203-26.000.
Morimura, Yasuhiro: *See*—
Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, 4,600,627, Cl. 428-203.000.
Morishima, Kazuo, to Honda Giken Kogyo K.K. Speaker system for motorcycles. 4,600,208, Cl. 280-289.00A.
Moriya, Koichi: *See*—
Shiokawa, Kozo; Kagabu, Shinzo; and Moriya, Koichi, 4,600,792, Cl. 560-12.000.
Moriyama, Takashi. Apparatus for baring electric cables. 4,599,794, Cl. 30-90.600.
Morley, Thomas J.: *See*—
Johnson, Ronald C.; Johnson, Rex M.; Jankowiak, Henry; Morley, Thomas J.; Dingwall, Robert P.; and Heimerich, Henry R., 4,599,941, Cl. 100-215.000.
Moroo, Akira; Tokunaga, Yoshiyasu; Suzuki, Takashi; and Yoshioka, Tadahiko, to Inoue Seisakusho (Mfg.) Co., Ltd. Kneading machine. 4,600,313, Cl. 366-313.000.
Morozumi, Shinji, to Seiko Epson Corporation. Liquid crystal display device having color filter triads. 4,600,274, Cl. 350-339.00F.
Morris, Arthur J.: *See*—
Durst, Douglas G.; and Morris, Arthur J., 4,600,055, Cl. 166-115.000.
Morris, Billy J., to Industrial Manufacturers of Orosi. Apparatus for filling containers with primary and secondary supply chutes. 4,600,065, Cl. 177-123.000.
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, to Ludwig Heumann & Co., GmbH. Pharmaceutical preparation. 4,600,721, Cl. 514-367.000.
Morton Thiokol, Inc.: *See*—
Groustra, Edward P.; and Roberts, Henry J., 4,599,945, Cl. 102-256.000.
Korngold, Emmanuel, 4,600,493, Cl. 204-301.000.
Moscony, John J.: *See*—
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,600,470, Cl. 156-644.000.
Mosser, Jacqueline: *See*—
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.
Motorola, Inc.: *See*—
Anderson, George F.; and Burt, Dan L., 4,600,658, Cl. 428-450.000.
Anttila, Dennis A., 4,600,256, Cl. 339-17.00M.
Carney, Scott N.; and Linder, Donald L., 4,601,061, Cl. 455-208.000.
Dunkerton, Stephen H.; Petreye, David R.; Erickson, Gary D.; and Reynolds, Gary R., 4,600,922, Cl. 340-825.440.
Dydyk, Michael, 4,600,894, Cl. 330-287.000.
Rugen, Thomas W., 4,600,889, Cl. 329-50.000.
Shumaker, Wayne G., 4,600,904, Cl. 333-173.000.
Mourrier, Francis; and Pelissier, Felix, to Clextral. Material-processing screw machine. 4,600,311, Cl. 366-88.000.
MTA Termeszettudomanyi Kutato Laboratoriumai: *See*—
Libor, Oszkar; Nagy, Gabor; and Szekely, Tamas, 4,600,744, Cl. 524-446.000.
MTU Motoren - und Turbinen-Union Muenchen GmbH: *See*—
Schaeffler, Arthur; and Werner, Klemens, 4,600,202, Cl. 277-53.000.
Thoma, Martin; and Bunger, Paul, 4,600,479, Cl. 204-14.100.
Muchnik, Boris J.: *See*—
Spong, Fred W.; Muchnik, Boris J.; and Kalk, Franklin D., 4,600,682, Cl. 430-270.000.
Mueller, George R.; and Huitema, Thomas W., to J. I. Case Company. Ignition control system. 4,600,966, Cl. 361-166.000.
Muir, Francis, to Chevron Research Company. Seismic exploration using non-impulsive vibratory sources activated by stationary, Gaussian codes, and processing the results in distortion-free final records particularly useful in urban areas. 4,601,022, Cl. 367-14.000.
Mukoh, Akio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.
Mukoyama, Kenji, to Makita Electric Works, Ltd. Nail driving tool. 4,600,135, Cl. 227-120.000.
Mulder, Douglas C., to Nordson Corporation. Powder spray apparatus and powder spray method. 4,600,603, Cl. 427-180.000.
Muller, Franz-Josef: *See*—
Bertleff, Werner; Muller, Franz-Josef; Kummer, Rudolf; and Harder, Wolfgang, 4,600,726, Cl. 518-701.000.
Muller, Friedmann: *See*—
Zabrocki, Karl; Lindner, Christian; Muller, Friedmann; and Doring, Joachim, 4,600,747, Cl. 525-83.000.
Muller, Hanns P.: *See*—
Hassel, Tillmann; and Muller, Hanns P., 4,600,771, Cl. 536-22.000.
Muller, Kurt: *See*—
Dreyfuss, Wilfried; Remp, Thomas E.; and Muller, Kurt, 4,599,778, Cl. 29-272.000.
Muller, Norbert, to Mannesmann Aktiengesellschaft. Electrode mounting in DC arc furnace vessels. 4,601,041, Cl. 373-72.000.
Muller, Peter R.: *See*—
Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, 4,600,632, Cl. 428-220.000.
Muller, Werner: *See*—
Clostermeyer, Gerhard; and Muller, Werner, 4,599,844, Cl. 53-118.000.
Multi-Tex Products Corp.: *See*—
Dwulet, Michaelene, 4,600,643, Cl. 428-375.000.
Multiple-Housing Drapery Services, Inc.: *See*—
Stiers, Joseph D., 4,599,958, Cl. 112-262.100.
Munemoto, Eiji: *See*—
Kawakubo, Osamu; Munemoto, Eiji; and Okubora, Akihiko, 4,600,397, Cl. 445-6.000.
Murakami, Eiji: *See*—
Sano, Yasuro; and Murakami, Eiji, 4,599,959, Cl. 112-266.100.
Murakami, Mitsuharu: *See*—
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.
Murakoshi, Hisaya: *See*—
Ichihashi, Mikio; Fukuhara, Satoru; Okumura, Masahide; and Murakoshi, Hisaya, 4,600,839, Cl. 250-310.000.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,600,576, Cl. 424-49.000.
Murase, Noriyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Method of making corrosion-resistant end plate of cladding type for high pressure vessel. 4,600,139, Cl. 228-184.000.
Murata, Hideki: *See*—
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki, 4,600,676, Cl. 430-106.600.
Murata Manufacturing Co., Ltd.: *See*—
Inano, Mitsumasa; and Okane, Masaaki, 4,600,116, Cl. 206-330.000.
Murayama, Hiroyoshi: *See*—
Mizutani, Akihiko; Murayama, Hiroyoshi; Arakawa, Kohsaku; and Tanaka, Saburo, 4,600,513, Cl. 210-712.000.
Murphy, Arthur D.; and Grattidge, Alan E. T., to John M. Henderson and Company Limited. Vessel nozzle cleaning apparatus and methods. 4,599,967, Cl. 118-72.000.
Murray, Joseph E., Jr. Telescope with multiple image-viewing assemblies. 4,600,277, Cl. 350-561.000.
Musil, Joseph E., to Cedarapids, Inc. Refractoriless liquid fuel burner. 4,600,377, Cl. 431-351.000.
Musil, Rudolf: *See*—
Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, 4,600,390, Cl. 433-218.000.

Musseau, Joel R.: *See—*
Bos, Pierre H.; Musseau, Joel R.; and Richard, Jean-Pierre, 4,600,155, Cl. 241-37.500.

Musso, Gary F.: *See—*
Kaiser, Emil T.; and Musso, Gary F., 4,600,532, Cl. 260-998.210.

Mutoh, Shinichiro: *See—*
Fujita, Sadao; Toyokawa, Akira; Mutoh, Shinichiro; Shimomukai, Eishu; and Ueda, Kenji, 4,600,378, Cl. 432-8.000.

Myotoku Ltd.: *See—*
Ise, Yoji, 4,600,230, Cl. 294-64.200.
Ise, Yoji; and Kawada, Masakichi, 4,600,363, Cl. 417-187.000.

N K B Co., Ltd.: *See—*
Taki, Hisao; and Iida, Takeo, 4,600,460, Cl. 156-235.000.

Naab, Paul: *See—*
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, 4,600,778, Cl. 546-249.000.

Nagahira, Jyoji: *See—*
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.

Nagai, Kiyotaka: *See—*
Saito, Hiroshi, Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.

Nagao, Yoshiaki: *See—*
Kamata, Yoshikiyo; and Nagao, Yoshiaki, 4,599,978, Cl. 123-73.00V.

Nagase, Tetsuo, to Pioneer Electronic Corporation. Rotary head assembly for use in a tape recording/reproducing apparatus. 4,600,956, Cl. 360-106.000.

Nagy, Gabor: *See—*
Libor, Oszkar; Nagy, Gabor; and Szekely, Tamas, 4,600,744, Cl. 524-446.000.

Naia, Michael, to Cooper Industries. Bulb packaging arrangement. 4,600,101, Cl. 206-422.000.

Nakagawa, Sumio: *See—*
Oka, Masaya; and Nakagawa, Sumio, 4,600,200, Cl. 273-313.000.

Nakagome, Hideki; and Yasuda, Satoshi, to Kabushiki Kaisha Toshiba. Magnetic refrigerator. 4,599,866, Cl. 62-3.000.

Nakai, Kiyoto; and Hosokawa, Kanji, to Japan Vilene Co., Ltd. Method of producing stretchable wadding. 4,600,605, Cl. 427-379.000.

Nakajima, Minoru: *See—*
Kitakohji, Toshisuke; Takeda, Shiro; Nakajima, Minoru; and Tokunaga, Hiroshi, 4,600,685, Cl. 430-313.000.

Nakama, Taihei: *See—*
Furuhata, Takashi; Nakama, Taihei; and Masuda, Yoshinori, 4,600,953, Cl. 360-10.300.

Nakamura, Eitaro; Hata, Kotaro; and Yamamoto, Makoto, to Nippon Zeon Co., Ltd. Electron-beam reactive magnetic coating composition for magnetic recording media. 4,600,521, Cl. 252-62.540.

Nakamura, Norihiko, to Rhythm Watch Co., Ltd. Whole body swingable clock. 4,600,315, Cl. 368-135.000.

Nakamura, Shigeo: *See—*
Aoki, Kunitoshi; and Nakamura, Shigeo, 4,600,541, Cl. 558-321.000.

Nakamura, Taku; Hirano, Mitsunori; Ogawa, Masasi; and Ishigaki, Kunio, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material. 4,600,687, Cl. 430-529.000.

Nakanishi, Akira: *See—*
Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.

Nakano, Tomio: *See—*
Mochizuki, Hirohiko; Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,601,017, Cl. 365-189.000.

Nakata, Hidefumi: *See—*
Shibata, Hiroshi; Toyoda, Hiroyasu; and Nakata, Hidefumi, 4,600,833, Cl. 250-216.000.

Nakatani, Tohru; and Akiyama, Teruo, to Kabushiki Kaisha Komatsu Seisakusho. Fluid operated pump displacement control system. 4,600,364, Cl. 417-216.000.

Nakayama, Norikatu: *See—*
Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, 4,600,749, Cl. 525-314.000.

Nakayama, Noritaka: *See—*
Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, 4,600,688, Cl. 430-558.000.

Nakazawa, Toru, to Mita Industrial Co., Ltd. Electrophotographic process. 4,600,668, Cl. 430-31.000.

Nakazawa, Yoshinori: *See—*
Torisaka, Yasunori; Ohuchi, Kiyoyuki; and Nakazawa, Yoshinori, 4,600,446, Cl. 148-2.000.

Nalco Chemical Company: *See—*
Ries, Donald G.; and Roof, Glenn L., 4,600,518, Cl. 252-34.000.

Nambudiri, Easwaran C. N., to Pitney Bowes Inc. Monitoring circuit for an electronic postage meter. 4,600,987, Cl. 364-200.000.

Nanometrics Incorporated: *See—*
Grund, J. Evan, 4,600,832, Cl. 250-201.000.

Napier, James C.: *See—*
Metcalfe, Arthur G.; Napier, James C.; and Compton, William A., 4,600,414, Cl. 55-290.000.

Naslund, Jan I. Arrangement in apparatus for preparing solutions from harmful substances. 4,600,040, Cl. 141-18.000.

National Controls Corporation: *See—*
Holt, Ronald R.; Joseph, William A.; and Zeissler, Edward J., 4,601,004, Cl. 364-557.000.

National Research Development Corporation: *See—*
Fisher, Martin J.; Heron, Roger A.; and Hughes, Martin L., 4,599,893, Cl. 73-61.00R.
James, James R.; Johnson, Reginald H.; Henderson, Ann; and Ponting, Mary H., 4,600,018, Cl. 128-804.000.

National-Standard Company: *See—*
Carlson, James D.; and Colucci, Stephen L., 4,600,622, Cl. 428-135.000.

National Starch and Chemical Corporation: *See—*
Gleason, Patricia A.; and Szymanski, Chester D., 4,600,515, Cl. 252-8.50A.

Natter, Eckard F.: *See—*
Lobsinger, James R.; Sweet, Steven R.; and Natter, Eckard F., 4,600,924, Cl. 343-17.10R.

Naumann, Fritz; and Haldenwanger, Hans-Gunther, to Audi AG. Apparatus for moving the tongue of a seat belt into a position for easy insertion into a buckle. 4,600,217, Cl. 280-808.000.

Nautilus Sports/Medical Industries, Inc.: *See—*
Jones, Arthur A., 4,600,196, Cl. 272-134.000.

Nawrot, James. Energy saving building and method of constructing same. 4,599,830, Cl. 52-90.000.

NCR Corporation: *See—*
Nogami, Masaru; Inaba, Masafumi; and Oki, Yoshitaka, 4,600,828, Cl. 235-379.000.

NEC Corporation: *See—*
Hayashi, Takao; Arai, Masanobu; and Shinozuka, Takashi, 4,600,811, Cl. 179-16.0AA.
Matsumori, Shigemitsu, 4,600,324, Cl. 400-144.100.

Needham, Donald G., to Phillips Petroleum Company. Pigment concentrates for resins. 4,600,736, Cl. 523-351.000.

Nelgo Manufacturing Corporation: *See—*
Gongwer, Nelson; and Gongwer, Dean, 4,600,596, Cl. 426-523.000.

Nelson, Glenn S., to Board of Trustees University of Arkansas. Fowl metering and cooping system. 4,600,351, Cl. 414-331.000.

Nelson, Ronald S.; and Loflin, John D., to Lilly Company, The. Conductive coatings. 4,600,598, Cl. 427-27.000.

Nenna, Vito, to Vinen Corp. Method of forming the primary core of a prestressed concrete pipe. 4,600,548, Cl. 264-71.000.

Nesbitt, Russell U., Jr.: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; Harris, Michael R.; and Nesbitt, Russell U., Jr., 4,600,645, Cl. 428-403.000.

Nestec S.A.: *See—*
Akesson, Yngve R., 4,600,159, Cl. 241-280.000.
Svengren, Anders G.; and Ganrot, Bertil A., 4,600,595, Cl. 426-501.000.

Nestich, R. Frank, to Clevepak Corporation. Ball cock and float assembly. 4,600,031, Cl. 137-218.000.

Neuffer, Kurt: *See—*
Hurst, Kurt; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,600,958, Cl. 360-123.000.

Neukomm, Peter, to Pewa Technic AG. Gas engine with gas supply device. 4,599,864, Cl. 60-671.000.

New York Institute of Technology: *See—*
Stern, Garland, 4,600,919, Cl. 340-725.000.

Newall, Christopher E.: *See—*
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., 4,600,772, Cl. 544-625.000.

Newberg, Irwin L.: *See—*
Wagner, Gene A.; and Newberg, Irwin L., 4,600,892, Cl. 330-144.000.

Newman, David M. Cosmetic article. 4,600,030, Cl. 132-88.500.

Newsome, Reginald W.: *See—*
Houck, Willie G.; Newsome, Reginald W.; Nichols, Walter A.; and Thesing, Richard A., 4,600,027, Cl. 131-336.000.

Neyrinck, Luc: *See—*
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, 4,600,338, Cl. 405-74.000.

Ng, Yee S.; Contois, Lawrence E.; Mitchell, John D.; and Walling, James D., to Eastman Kodak Company. Electrophotographic color proofing element and method for using the same. 4,600,669, Cl. 430-47.000.

NGK Insulators, Ltd.: *See—*
Matsui, Minoru; and Soma, Takao, 4,600,038, Cl. 138-140.000.
Sato, Nobuo, 4,600,509, Cl. 210-230.000.

Nichols, George M.: *See—*
Carr, Lawrence J.; and Nichols, George M., 4,600,791, Cl. 558-80.000.

Nichols, Walter A.: *See—*
Houck, Willie G.; Newsome, Reginald W.; Nichols, Walter A.; and Thesing, Richard A., 4,600,027, Cl. 131-336.000.

Nico-Pyrotechnik Hanns-Juergen Diederichs GmbH & Co., KG.: *See—*
Luebbers, Willi, 4,599,946, Cl. 102-274.000.

Nielsen, Arnold T.: *See—*
Chafin, Andrew P.; and Nielsen, Arnold T., 4,600,536, Cl. 260-349.000.

Nieman, Gerald R.; Thompson, James E.; Couper, William D.; and Clyatt, Clarence L., III, to International Telephone & Telegraph Corp. Electrical connector embodying electrical circuit components. 4,600,262, Cl. 339-147.00R.

Nievergelt, Hermann: *See—*
Bednorz, Johannes G.; Lanz, Martin A.; Nievergelt, Hermann; and Pohl, Wolfgang D., 4,600,854, Cl. 310-331.000.

Niewald, Jack L.; and Kelch, Eugene W. Multiple-use utility jack and tire changing tool. 4,600,354, Cl. 414-607.000.
Nifco Inc.: *See—*
Kimura, Shigeru, 4,600,978, Cl. 362-365.000.
Nihon Tokushu Noyaku Seizo K.K.: *See—*
Shiokawa, Kozo; Kagabu, Shinzo; and Moriya, Koichi, 4,600,792, Cl. 560-12.000.
Nikolaus, Peter: *See—*
Piorr, Robert; Schluessler, Hans-Joachim; and Nikolaus, Peter, 4,600,523, Cl. 252-174.220.
Nilsson, Mary, Goran Nilsson, heirs: *See—*
Nilsson, Vilgot, deceased, 4,600,049, Cl. 165-1.000.
Nilsson, Vilgot, deceased (Nilsson, Mary, Goran Nilsson, heirs), to Alfa-Laval Marine and Power Engineering AB. Method and system for operating a cooling plant. 4,600,049, Cl. 165-1.000.
Nippon Air Brake Co., Ltd.: *See—*
Mitsuhashi, Wataru; Kaminaka, Kouji; and Kotani, Kaname, 4,599,824, Cl. 49-141.000.
Nippon Electric Co., Ltd.: *See—*
Ishida, Ichiro, 4,601,015, Cl. 365-162.000.
Watari, Masao; and Chiba, Seibi, 4,601,054, Cl. 382-1.000.
Nippon Kogaku K. K.: *See—*
Maida, Osamu; and Katayama, Akira, 4,600,289, Cl. 354-448.000.
Nippon Notion Kogyo Co., Ltd.: *See—*
Kasai, Kazumi, 4,599,767, Cl. 24-236.000.
Nippon Precision Circuits Ltd.: *See—*
Akita, Shinichi, 4,600,959, Cl. 360-137.000.
Nippon Sheet Glass Co., Ltd.: *See—*
Yamasaki, Tetsuya; Kishimoto, Takashi; and Yamauchi, Ichirou, 4,600,267, Cl. 350-96.150.
Nippon Soken, Inc.: *See—*
Hayashi, Ikuo; Idogaki, Takaharu; and Kawai, Hisasi, 4,600,867, Cl. 318-341.000.
Idogaki, Takaharu; Hayashi, Ikuo; and Kawai, Hisasi, 4,600,871, Cl. 318-653.000.
Nippon Steel Corporation: *See—*
Sato, Takashi; Ozawa, Tsutomu; and Minamida, Katsuhiro, 4,600,048, Cl. 164-463.000.
Nippon Zeon Co., Ltd.: *See—*
Nakamura, Eitaro; Hata, Kotaro; and Yamamoto, Makoto, 4,600,521, Cl. 252-62.540.
Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Fuel tank with filling up indicating device for vehicle. 4,600,041, Cl. 141-95.000.
Nishide, Kazuhiro: *See—*
Yamano, Shoji; Mikata, Yoshitaka; Higuchi, Tadashi; and Nishide, Kazuhiro, 4,600,096, Cl. 198-505.000.
Nishimoto, Yoshiharu: *See—*
Ohya, Masaki; and Nishimoto, Yoshiharu, 4,600,616, Cl. 428-36.000.
Nishioka, Jim Z. Archery bow. 4,599,986, Cl. 124-24.00R.
Nissan Motor Co., Ltd.: *See—*
Kitahara, Hisashi; Hattori, Noboru; Kato, Yoshiaki; and Hitomi, Nobuteru, 4,600,071, Cl. 180-53.800.
Kuroki, Junsuke; and Sugasawa, Fukashi, 4,600,215, Cl. 280-707.000.
Ohashi, Keizi; and Takahashi, Kazuo, 4,600,733, Cl. 523-144.000.
Sekine, Yoshitada; and Yokota, Fumiki, 4,600,869, Cl. 318-568.000.
Nisshin Flour Milling Co., Ltd.: *See—*
Nomura, Satoshi; and Ishigami, Shinji, 4,600,587, Cl. 426-19.000.
NL Industries, Inc.: *See—*
Fontenot, John E., 4,599,904, Cl. 73-783.000.
Nobelius, Gunilla: *See—*
Larsson, Bernt; Nobelius, Gunilla; and Johansson, Elisabet, 4,600,735, Cl. 523-216.000.
Noe, Renato R. Mechanical seal plugs for fluid-sealing of tubes. 4,600,036, Cl. 138-89.000.
Nogami, Masaru; Inaba, Masafumi; and Oki, Yoshitaka, to NCR Corporation. Automatic issuance of passbooks and the like. 4,600,828, Cl. 235-379.000.
Nohara, Yoshio: *See—*
Kaneko, Shigeru; Hirata, Yoshiaki; and Nohara, Yoshio, 4,600,370, Cl. 425-38.000.
Nomori, Hiroyuki: *See—*
Fujimaki, Yoshihide; Takimoto, Masataka; and Nomori, Hiroyuki, 4,600,292, Cl. 355-3.0SC.
Nomura, Norimasa: *See—*
Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, 4,600,287, Cl. 354-299.000.
Nomura, Satoshi; and Ishigami, Shinji, to Nisshin Flour Milling Co., Ltd. Process of manufacturing frozen dough of yeast-fermented dough. 4,600,587, Cl. 426-19.000.
Nonaka, Yuji: *See—*
Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.
Norchem, Inc.: *See—*
Schmukler, Seymour; Shida, Mitsuzo; and Machonis, John, Jr., 4,600,746, Cl. 525-57.000.
Nordson Corporation: *See—*
Mulder, Douglas C., 4,600,603, Cl. 427-180.000.
Price, Richard P., 4,600,124, Cl. 222-54.000.
Noren, Don W. Heat exchanger. 4,600,050, Cl. 165-104.140.
Norrie, David G., to Pilkington P.E. Limited. Infra-red optical systems. 4,600,265, Cl. 350-1.300.
Norris, Peter E., to GTE Laboratories Incorporated. Enhanced mobility buried channel transistor structure. 4,600,932, Cl. 357-22.000.
Norton Company: *See—*
Kelly, Robert G.; and Spang, Walter G., 4,600,468, Cl. 156-440.000.
Novatome: *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.
Novotny, Joseph, to Allied Corporation. Method and composition for corrosion inhibition of carbon steel by ammonium sulfate. 4,600,558, Cl. 422-7.000.
Nozawa, Ryoichiro; Kawamura, Hideaki; Sasaki, Takao; and Hirose, Satoru, to Fanuc Ltd. Numerical control method and apparatus therefor. 4,600,985, Cl. 364-169.000.
NSK-Warner K.K.: *See—*
Ogata, Shigeji, 4,600,626, Cl. 428-193.000.
Nukem GmbH: *See—*
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, 4,600,610, Cl. 428-2.000.
Nuovo Pignone S.p.A.: *See—*
Corain, Luciano, 4,600,039, Cl. 139-434.000.
Nuss, Lothar: *See—*
Bachmann, Wolfgang; Spahn, Dieter; and Nuss, Lothar, 4,599,881, Cl. 72-128.000.
N.V. Atlas Copco Airpower Corp.: *See—*
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, 4,600,338, Cl. 405-74.000.
O&K Orenstein & Koppel Aktiengesellschaft: *See—*
Bentz, Helmut, 4,600,246, Cl. 305-54.000.
Oba, Hideaki: *See—*
Abe, Michiharu; and Oba, Hideaki, 4,600,625, Cl. 428-167.000.
Oberschmidt, Alec: *See—*
Shillington, Richard A.; and Oberschmidt, Alec, 4,600,112, Cl. 215-274.000.
O'Callaghan, Cynthia H.; Livermore, David G. H.; and Newall, Christopher E., to Glaxo Group Limited. Cephalosporin antibiotics. 4,600,772, Cl. 544-625.000.
Ogata, Shigeji, to NSK-Warner K.K. Webbing suitable for use in vehicle seat belt system. 4,600,626, Cl. 428-193.000.
Ogata, Yoshiro: *See—*
Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, 4,600,862, Cl. 315-358.000.
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Element for electrophoresis. 4,600,641, Cl. 428-355.000.
Ogawa, Masasi: *See—*
Nakamura, Taku; Hirano, Mitsunori; Ogawa, Masasi; and Ishigaki, Kunio, 4,600,687, Cl. 430-529.000.
Ogden, James R. Building panel installation device. 4,600,183, Cl. 269-43.000.
Oguro, Kaoru: *See—*
Washita, Hiroshi; and Oguro, Kaoru, 4,600,653, Cl. 428-425.600.
O'Halloran, Rosemary: *See—*
Gutierrez, Antonio; O'Halloran, Rosemary; and Brois, Stanley J., 4,600,519, Cl. 252-48.600.
Ohashi, Keizi; and Takahashi, Kazuo, to Nissan Motor Co., Ltd. Disintegration assistant for casting molds. 4,600,733, Cl. 523-144.000.
Ohguchi, Masakatsu: *See—*
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, Fumikazu; and Ohguchi, Masakatsu, 4,600,743, Cl. 524-377.000.
Ohhashi, Yasutake: *See—*
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, 4,600,047, Cl. 164-453.000.
Ohno, Shigeru, to Shin-Etsu Chemical Co., Ltd. Sustainedly vapor-releasing body having excellent shape-retainability. 4,600,146, Cl. 239-6.000.
Ohno, Shigeru: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,600,671, Cl. 430-57.000.
Ohno, Yoshihiro, to Seiko Epson Corporation. Display panel having conductive contact media. 4,600,273, Cl. 350-336.000.
Ohnuki, Yukihiko: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,600,671, Cl. 430-57.000.
Ohsaka, Hiromi: *See—*
Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, 4,600,417, Cl. 55-413.000.
Ohtani, Masami: *See—*
Hotta, Tomiji; Ohtani, Masami; Masuda, Yoshihiro; Nomura, Norimasa; and Dohi, Yozi, 4,600,287, Cl. 354-299.000.
Ohte, Satoshi: *See—*
Fujimoto, Shigeru; Ohte, Satoshi; Kondo, Hirofumi; Matsumoto, Takuji; and Fujita, Takafumi, 4,599,834, Cl. 52-167.000.
Ohtsubo, Sadami: *See—*
Shimizu, Atsushi; and Ohtsubo, Sadami, 4,600,507, Cl. 210-94.000.
Ohtsuka, Shuichi; Yoda, Akira; Kimura, Akinori; and Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Electro-photographic device with a processing head having multiple chambers. 4,600,291, Cl. 355-3.00R.
Ohuchi, Kiyoyuki: *See—*
Torisaka, Yasunori; Ohuchi, Kiyoyuki; and Nakazawa, Yoshinori, 4,600,446, Cl. 148-2.000.
Ohya, Masaki; and Nishimoto, Yoshiharu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-shrinkable laminate film. 4,600,616, Cl. 428-36.000.
Oka, Masaya; and Nakagawa, Sumio, to Ikegami Tsushinki Co., Ltd. Three-dimensional image display system. 4,600,200, Cl. 273-313.000.

Okabe, Shotaro: *See*—
Fujiyama, Yasutomo; and Okabe, Shotaro, 4,599,971, Cl. 118-723.000.

Okamoto, Tsugio; and Maeda, Junichi, to Brother Kogyo Kabushiki Kaisha. Printing apparatus. 4,600,325, Cl. 400-208.000.

Okamoto, Yoshiyuki; and Rice, Joseph E., to Koppers Company, Inc. High pressure synthesis of substituted tetrathiafulvalenes. 4,600,784, Cl. 549-39.000.

Okane, Masaaki: *See*—
Inano, Mitsumasa; and Okane, Masaaki, 4,600,116, Cl. 206-330.000.

Okano, Haruo: *See*—
Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, 4,600,492, Cl. 204-298.000.

Oker, Thomas W., to Tom Oker Sales & Mfg., Inc. Apparatus for forming cubes from a product such as a loaf of cheese. 4,599,928, Cl. 83-581.100.

Oki Electric Industry Co., Ltd.: *See*—
Yamashita, Yoshio; and Kawazu, Ryuji, 4,600,684, Cl. 430-296.000.

Oki, Yoshitaka: *See*—
Nogami, Masaru; Inaba, Masafumi; and Oki, Yoshitaka, 4,600,828, Cl. 235-379.000.

Okubora, Akihiko: *See*—
Kawakubo, Osamu; Munemoto, Eiji; and Okubora, Akihiko, 4,600,397, Cl. 445-6.000.

Okumura, Masahide: *See*—
Ichihashi, Mikio; Fukuhara, Satoru; Okumura, Masahide; and Murakoshi, Hisaya, 4,600,839, Cl. 250-310.000.

Okuyama, Kiyotaka: *See*—
Hosaka, Akihiko; Okuyama, Kiyotaka; and Kanazawa, Kiyoto, 4,600,650, Cl. 428-413.000.

Olschansky, Brad; and Olschansky, Scott, to Lifeing, Inc. Multi-function exercise system. 4,600,189, Cl. 272-118.000.

Olschansky, Scott: *See*—
Olschansky, Brad; and Olschansky, Scott, 4,600,189, Cl. 272-118.000.

Olsen, Robert A., to Sybron Corporation. Swivel coupling for illuminated dental handpiece. 4,600,384, Cl. 433-29.000.

Olson, Daniel R., to General Electric Company. Thermoplastic resinous substrates having an external thin glass sheet protective layer. 4,600,640, Cl. 428-332.000.

Olson, Jay H.: *See*—
Lundie, William R.; and Olson, Jay H., 4,600,122, Cl. 221-211.000.

Olson, Wayne L. Helical coil dispensing machine apparatus. 4,600,119, Cl. 221-75.000.

Olsson, Billy E., to AMP Incorporated. Electrical terminal having wire-receiving slot for relatively small diameter wires and connectors containing such terminals. 4,600,259, Cl. 339-99.00R.

Omachi, Yoshio, to Kabushiki Kaisha Komatsu Seisakusho. Method and apparatus for injecting fuel for a diesel engine. 4,599,983, Cl. 123-497.000.

Omark Industries, Inc.: *See*—
Geddes, Norman R., 4,600,145, Cl. 238-351.000.

Omi, Kyoji, to Ricoh Company, Ltd. Light beam scanning apparatus with a variable scanning width. 4,600,266, Cl. 350-3.710.

Omni Tech Corporation: *See*—
Anderson, Terry W., 4,600,249, Cl. 312-196.000.

Omron Tateisi Electronics Co.: *See*—
Tsuji, Shuji; Ito, Hiroshi; and Saka, Kazuhiko, 4,601,057, Cl. 382-51.000.

Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, to Kabushiki Kaisha Tokuda Seisakusho; and Kabushiki Kaisha Toshiba. Magnet driving method and device for same. 4,600,492, Cl. 204-298.000.

op de Beeck, Peter: *See*—
Stelter, Norbert; Wuest, Rainer; op de Beeck, Peter; and Bofginer, Gerd, 4,599,918, Cl. 74-866.000.

Opitz, Reinhard; Hosemann, Kurt; and Portz, Heinz, to Henkel Kommanditgesellschaft auf Aktien. After-passivation of phosphated metal surfaces. 4,600,447, Cl. 148-6.15R.

Oppawsky, Steffen: *See*—
Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, 4,600,390, Cl. 433-218.000.

Oppitz, Hans, to ELTAC Nogler & Daum KG. Electro-osmotic movement of polar liquid in a porous structural material. 4,600,486, Cl. 204-182.300.

Orion Research, Inc.: *See*—
Bromberg, Edward E. A.; Diggens, Albert; West, Steven J.; and Ross, James W., 4,600,494, Cl. 204-401.000.

O'Rourke, Joseph D.: *See*—
Pitchon, Esra; O'Rourke, Joseph D.; and Joseph, Theodore H., 4,600,472, Cl. 159-4.400.

Orren, David R. N., to Fuller Company. Plate for oscillating-type transporter. 4,600,098, Cl. 198-773.000.

Orthopedic Design, Inc.: *See*—
Schmid, Rainer, 4,599,920, Cl. 81-489.000.

Ortiz, Jose A.: *See*—
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.

Osborn, Claiborn L.: *See*—
Robeson, Lloyd M.; and Osborn, Claiborn L., 4,600,647, Cl. 428-412.000.

Oscar Mayer Foods Corporation: *See*—
Mengel, Ronald E.; and Seipel, Thomas E., 4,600,160, Cl. 241-282.200.

Osmanski, Anthony M.: *See*—
La Rocca, Angelo A.; and Osmanski, Anthony M., 4,600,881, Cl. 324-74.000.

Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., to Standard Manufacturing Company, Inc. Trailing arm suspension. 4,600,069, Cl. 180-24.020.

Oswald, Richard W., to Armstrong Rubber Company. Method and apparatus for forming woven endless tire reinforcing belts. 4,600,456, Cl. 156-117.000.

Oten, Peter D. Vacuum cup. 4,600,229, Cl. 294-64.100.

Oturu, Hiromi: *See*—
Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, 4,600,627, Cl. 428-203.000.

Outboard Marine Corporation: *See*—
Bailey, Frank V.; Larsen, Robert T.; and VanRens, Russell J., 4,600,046, Cl. 164-34.000.
Breckenfeld, Paul W.; Broughton, George L.; Calamia, David C.; and Macier, James E., 4,599,979, Cl. 123-73.0AD.

Owens-Corning Fiberglas Corporation: *See*—
Lee, David M.; Hutchings, David A.; Sieloff, Gloria M.; and Willard, G. Fred, 4,600,765, Cl. 528-193.000.
Stotler, David V.; and Coffey, Fred S., 4,600,423, Cl. 65-4.400.

Ozawa, Masataka: *See*—
Ito, Kazuhiko; Katsura, Takashi; Ozawa, Masataka; Koyama, Kazutaka; and Ogata, Yoshiro, 4,600,862, Cl. 315-358.000.

Ozawa, Tsutomu: *See*—
Sato, Takashi; Ozawa, Tsutomu; and Minamida, Katsuhiro, 4,600,048, Cl. 164-463.000.

Ozin, Geoffrey A.; and Molnar, Karl. Cryogenic deposition of catalysts. 4,599,869, Cl. 62-55.500.

Padilla, Amando C. Transmutable rule. 4,599,805, Cl. 33-464.000.

Pallos, Ferenc M., to Stauffer Chemical Company. N-pyrimidyl aryloxyphenoxy alkanoic acid amides and methods of use. 4,600,431, Cl. 71-92.000.

Palmer, Larry A. Gas operated firearm. 4,599,934, Cl. 89-193.000.

Paltrow, Robert W.: *See*—
Bradley, William P.; Herman, Michael; and Paltrow, Robert W., 4,600,141, Cl. 229-92.700.

Pammer, Erich; and Bischofberger, Otfried, to Siemens Aktiengesellschaft. Method for the galvanic manufacture of metallic bump-like lead contacts. 4,600,600, Cl. 427-89.000.

Panhandle Industries, Inc.: *See*—
Hidle, Jerry, 4,600,162, Cl. 242-55.200.

Pannier, Gerard: *See*—
Leorat, Francois; and Pannier, Gerard, 4,599,917, Cl. 74-866.000.

Panora, Robert A.: *See*—
Fritzsche, Donald E.; Panora, Robert A.; and Bangert, Matthew D., 4,599,990, Cl. 126-351.000.

Papanicolaou, Nicolas A.: *See*—
Whitlock, Robert R.; and Papanicolaou, Nicolas A., 4,600,853, Cl. 310-313.00B.

Parent, Christopher A.; and Voss, James R. Positioning systems. 4,600,083, Cl. 187-7.000.

Park, Moo-Kwang: *See*—
Lin, Song-Ling; and Park, Moo-Kwang, 4,600,575, Cl. 424-45.000.

Parker, Eric G.: *See*—
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,600,662, Cl. 428-624.000.

Parker, John A.: *See*—
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,600,769, Cl. 528-322.000.

Parkes, Donald H., to Shivvers, Incorporated. Grain dryer system. 4,599,809, Cl. 34-31.000.

Parnham, Michael J.: *See*—
Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, 4,600,722, Cl. 514-367.000.

Parrini, Paolo: *See*—
Galli, Paolo; and Parrini, Paolo, 4,600,545, Cl. 264-11.000.

Parsons, David, to Automotive Products plc. Liquid pressure apparatus. 4,599,860, Cl. 60-584.000.

Pascarella, Vincent J.: *See*—
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., 4,600,652, Cl. 428-423.300.

Pastor, Ricardo C.; and Gorre, Luisa E., to Hughes Aircraft Company. Process for the removal of impurities from optical component materials. 4,600,442, Cl. 134-2.000.

Pastorino, Ronald L., to U.S. Peroxygen Company. Composition and method for making foamed polyester resin. 4,600,727, Cl. 521-82.000.

Patel, Chhotubhai N.: *See*—
Patel, Ramchandra L.; and Patel, Chhotubhai N., 4,600,053, Cl. 165-170.000.

Patel, Ramchandra L.; and Patel, Chhotubhai N., to Ford Motor Company. Heat exchanger structure. 4,600,053, Cl. 165-170.000.

Pateras Pescara de Castelluccio, Christian, to S.A.R.L. Dite Industrielle Francaise de Mecanique Flambeau. Apparatus for measuring the real evapotranspiration of a plant cover, for measuring the amount of carbon dioxide exchanged between said plant cover and the atmosphere and for measuring the hydrous state of the ground around the plant cover. 4,599,889, Cl. 73-23.000.

Patoray, Stephen A.: *See*—
Griffen, Neil C.; and Patoray, Stephen A., 4,600,066, Cl. 177-211.000.

Patt, William, to Warner-Lambert Company. Benzothien-3-yl adenosine; benzothien-3-yl adenosine, S-oxide; and benzothien-3-yl, S,S-dioxide adenosine compounds. 4,600,707, Cl. 514-46.000.

Patzschke, Hans-Peter; Goebel, Armin; and Klein, Klausjorg, to Herberts Gesellschaft mit beschraenkter Haftung. Aqueous electrodip lacquer coating compound capable of being deposited at the cathode, and its use. 4,600,485, Cl. 204-181.700.

Paul, Byron G.; Maynard, James H.; and Dalrymple, John C., to Tektronix, Inc. Highlighting and classifying segments on a CRT display. 4,601,021, Cl. 364-521.000.

Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, to Bayer Aktiengesellschaft. UV-stabilized polycarbonate mouldings. 4,600,632, Cl. 428-220.000.

Paulson, Kenneth R.: *See*—
Hendrickson, William A.; Evans, Jack L.; Paulson, Kenneth R.; and Wilson, Robert W., 4,600,673, Cl. 430-66.000.

Paulussen, Josephus F.: *See*—
Sels, Francis J.; Paulussen, Josephus F.; and Pollet, Robert J., 4,600,552, Cl. 264-300.000.

Pauwels, Michael A.; and Wright, Danny O., to Allied Corporation. Measuring barometric pressure with a manifold pressure sensor in a microprocessor based engine control system. 4,600,993, Cl. 364-431.050.

Pauwels-Trafo Belgium N.V.: *See*—
Meinert, Heinz, 4,600,911, Cl. 336-212.000.

Payne, David E. Boat construction. 4,599,963, Cl. 114-88.000.

Peavey Electronics Corporation: *See*—
Taylor, Wilson E., Jr.; and Hand, Larry E., 4,600,891, Cl. 330-10.000.

Peddinghaus, Rolf. Transverse conveyor of elongated workpieces. 4,600,099, Cl. 198-774.000.

Pedretti, Ugo; Perego, Giovanni; and Lugli, Gabriele, to Enichimica S.p.A. High-orientability polyacetylene films and process for their production. 4,600,756, Cl. 526-134.000.

Peek, Brian R.: *See*—
Doyle, Beryle S.; and Peek, Brian R., 4,599,768, Cl. 24-590.000.
Sutenbach, Paul M.; Peek, Brian R.; and Daubert, Richard F., 4,600,344, Cl. 411-435.000.

Pelissier, Felix: *See*—
Mourrier, Francis; and Pelissier, Felix, 4,600,311, Cl. 366-88.000.

Pelster, Heinrich: *See*—
Lindner, Otto; Pelster, Heinrich; Steffan, Guido; and Stuwe, Arnd, 4,600,542, Cl. 260-505.00C.

Penco, Sergio: *See*—
Angelucci, Francesco; Penco, Sergio; and Arcamone, Federico, 4,600,537, Cl. 260-351.100.

Pennsylvania Power and Light Company: *See*—
La Rocca, Angelo A.; and Osmanski, Anthony M., 4,600,881, Cl. 324-74.000.

Pennwalt Corporation: *See*—
Georgiev, Vassil S.; and Kinsolving, Clyde R., 4,600,782, Cl. 548-216.000.

Pepmiller, Paul E.: *See*—
Huffman, Charles E.; and Pepmiller, Paul E., 4,601,028, Cl. 370-15.000.

Perdue, Thad A., to Robbins Tire and Rubber Company, Inc. Apparatus and method for tire recapping. 4,600,467, Cl. 156-394.100.

Perego, Giovanni: *See*—
Pedretti, Ugo; Perego, Giovanni; and Lugli, Gabriele, 4,600,756, Cl. 526-134.000.

Perkin-Elmer Corporation, The: *See*—
Krohn, William T.; McNally, Mark J.; and Abreu, Rene, 4,600,307, Cl. 356-346.000.

Permanent Way Equipment Company Limited, The: *See*—
Hudson, Michael J.; and Sinclair, John C., 4,599,878, Cl. 72-19.000.

Perr, Clarence D.: *See*—
Field, Robert W.; Perr, Clarence D.; and Gerlach, Ronald R., 4,600,942, Cl. 358-122.000.

Petermann, Hans: *See*—
Ziegler, Wolfgang; and Petermann, Hans, 4,599,816, Cl. 40-544.000.

Peters, Arthur J.: *See*—
Marks, Eugene A.; and Peters, Arthur J., 4,600,912, Cl. 338-42.000.

Peterson, Frederick W., to RCA Corporation. Apparatus for coating a selected area of the surface of an object. 4,599,970, Cl. 118-504.000.

Peterson, John A.: *See*—
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,450, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormand F., 4,600,451, Cl. 149-19.300.
Jessop, Harvey A.; Abegg, M. Taylor; Peterson, John A.; Butler, Jay W.; McCormick, Ronald F.; and Lavery, Ormond F., 4,600,452, Cl. 149-19.300.

Petreye, David R.: *See*—
Dunkerton, Stephen H.; Petreye, David R.; Erickson, Gary D.; and Reynolds, Gary R., 4,600,922, Cl. 340-825.440.

Petsch, Johann. Digital current regulator circuit for control of bidirectional current flow through a load. 4,600,983, Cl. 363-63.000.

Pettit, Earl O. Panel hoist. 4,600,348, Cl. 414-11.000.

Pewa Technic AG: *See*—
Neukomm, Peter, 4,599,864, Cl. 60-671.000.

Pfeffer, Hans R.: *See*—
Wegehaupt, Karl-Heinrich; Pusch, Rudolf; and Pfeffer, Hans R., 4,600,657, Cl. 428-447.000.

Pfeiffenberger, Horst: *See*—
Ellermann, Jurgen; and Pfeiffenberger, Horst, 4,599,935, Cl. 92-159.000.

Pflieger, David C., to Hamilton Industries. Modular desk construction. 4,600,248, Cl. 312-195.000.

Philip Morris Incorporated: *See*—
Houck, Willie G.; Newsome, Reginald W.; Nichols, Walter A.; and Thesing, Richard A., 4,600,027, Cl. 131-336.000.

Phillips, Harley E., Jr. Wrecker assembly. 4,600,353, Cl. 414-563.000.

Phillips Petroleum Company: *See*—
Cheng, Paul J.; and Elkins, Tammy M., 4,600,496, Cl. 208-44.000.
Kukes, Simon G.; Hogan, Robert J.; Coombs, Daniel M.; and Howell, Jerald A., 4,600,504, Cl. 208-251.00H.
Needham, Donald G., 4,600,736, Cl. 523-351.000.

Phillips, W. Dale. Bracket kit. 4,600,232, Cl. 296-3.000.

Pianka, Max: *See*—
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, 4,600,429, Cl. 71-86.000.

Piatt, Michael J.: *See*—
Braun, Hilarion; and Piatt, Michael J., 4,600,928, Cl. 346-1.100.

Pichl, Heinz, to AB Volvo Penta. Boat drive. 4,600,395, Cl. 440-61.000.

Pierce, Howard E., Jr. Composite smoker's kit. 4,600,022, Cl. 131-243.000.

Pike, Roscoe A.: *See*—
Lamm, Foster P.; and Pike, Roscoe A., 4,600,738, Cl. 523-500.000.

Pilkington P.E. Limited: *See*—
Norrie, David G., 4,600,265, Cl. 350-1.300.

Pilling, Gerald A., to British Telecommunications. Line concentrator. 4,600,813, Cl. 179-18.0FC.

Pincers, Ojars W.: *See*—
Sherman, Victor L.; and Pincers, Ojars W., 4,600,511, Cl. 210-316.000.

Pinney, Robert V., Jr.: *See*—
Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Guthmueller, Rodney K., 4,601,056, Cl. 382-50.000.

Pioneer Electronic Corporation: *See*—
Nagase, Tetsuo, 4,600,956, Cl. 360-106.000.
Yoshida, Masayuki, 4,600,915, Cl. 340-347.0DA.

Piorr, Robert; Schluessler, Hans-Joachim; and Nikolaus, Peter, to Henkel Kommanditgesellschaft auf Aktien. Hydroxyalkyl polyethylene glycol ether foam inhibitors. 4,600,523, Cl. 252-174.220.

Pircio, Anthony W.; Buyniski, Joseph P.; and Comer, William T., to Bristol-Myers Company. Method of inhibiting diarrhea. 4,600,578, Cl. 424-78.000.

Pitchon, Esra; O'Rourke, Joseph D.; and Joseph, Theodore H., to General Foods Corporation. Apparatus for cooking or gelatinizing materials. 4,600,472, Cl. 159-4.400.

Pitney Bowes Inc.: *See*—
Nambudiri, Easwaran C. N., 4,600,987, Cl. 364-200.000.

Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., to International Flavors & Fragrances Inc. Thiogeranyl esters and organoleptic uses thereof. 4,600,576, Cl. 424-49.000.

Plessey Overseas Limited: *See*—
Lodge, Kevin J.; and Brettle, Jack, 4,600,642, Cl. 428-367.000.

Pluister, Jack W.: *See*—
Segredo, Anthony F.; Prendergast, Richard E.; Martin, Ralph E.; and Pluister, Jack W., 4,600,347, Cl. 413-26.000.

Plummer, Walter A. Method of making and using a shielded re-enterable jacket with dielectric spacer. 4,600,454, Cl. 156-55.000.

Pneumo Corporation: *See*—
Vanderlaan, Robert D., 4,600,910, Cl. 335-229.000.

Podoprigora, Georgy A., to Institut Sverkhtverdykh Materialov Akademii Naukukrainskoi SSR. Device for magnetoabrasive machining of workpieces. 4,599,826, Cl. 51-71.000.

Podosek, Edward, to Dennison National Company. Binder cover and method of manufacture thereof. 4,600,346, Cl. 412-3.000.

Poerschke, Peter: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.

Pohl, Wolfgang D.: *See*—
Bednorz, Johannes G.; Lanz, Martin A.; Nievergelt, Hermann; and Pohl, Wolfgang D., 4,600,854, Cl. 310-331.000.

Poirier, Marc-Andre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Process for breaking emulsions produced during recovery of bitumens and heavy oils. 4,600,501, Cl. 208-1s8.000.

Polaroid Corporation: *See*—
Fichter, Peter K., 4,600,680, Cl. 430-207.000.

Pollet, Robert J.: *See*—
Sels, Francis J.; Paulussen, Josephus F.; and Pollet, Robert J., 4,600,552, Cl. 264-300.000.

Pongsengsook, Phiraphol. Combination storage display and serving utensil. 4,600,253, Cl. 312-284.000.

Pontagnier, Henri: *See*—
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.

Ponting, Mary H.: *See*—
James, James R.; Johnson, Reginald H.; Henderson, Ann; and Ponting, Mary H., 4,600,018, Cl. 128-804.000.

Portz, Heinz: *See*—
Opitz, Reinhard; Hosemann, Kurt; and Portz, Heinz, 4,600,447, Cl. 148-6.15R.

Porzio, Anthony J.: *See*—
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., 4,599,784, Cl. 29-450.000.

Powell, Stanley L. Television antenna. 4,600,926, Cl. 343-742.000.

PPG Industries, Inc.: *See*—
Das, Suryya K.; and Dowbenko, Rostyslaw, 4,600,755, Cl. 526-81.000.
Emmert, Richard L., 4,600,298, Cl. 355-75.000.
Gillery, F. Howard; and Criss, Russell C., 4,600,490, Cl. 204-298.000.
Krumwiede, John F.; Hilliard, William G.; and Sims, Roy M., 4,600,425, Cl. 65-178.000.
Schwenninger, Ronald L., 4,600,426, Cl. 65-330.000.
Shoemaker, John B., 4,600,165, Cl. 242-118.400.

Prasse, Alfred: *See*—
Eck, Herbert; Menzel, Hartmut; Jira, Reinhard; and Prasse, Alfred, 4,600,790, Cl. 556-421.000.

Prat, Gisele: *See*—
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.

Praxl, Werner O.: *See*—
Friemel, Wolfgang F. R.; and Praxl, Werner O., 4,600,584, Cl. 424-128.000.

Precise Power Corporation: *See*—
Roesel, John F., Jr.; and Barber, Ronnie J., 4,600,873, Cl. 318-701.000.

Precision Auto Designs, Inc.: *See*—
Fritz, Albert E., 4,600,177, Cl. 254-338.000.

Preiss, Michael: *See*—
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, 4,600,778, Cl. 546-249.000.

Prendergast, Richard E.: *See*—
Segredo, Anthony F.; Prendergast, Richard E.; Martin, Ralph E.; and Pluister, Jack W., 4,600,347, Cl. 413-26.000.

Preston Engravers, Inc.: *See*—
Carlson, Leroy H., Jr.; and Kesten, Martin, 4,599,926, Cl. 83-100.000.

Price, Frank C.; and White, Anthony M., to USM Corporation. Transfer apparatus. 4,599,759, Cl. 12-1.00A.

Price, Macy J.; and Ball, Laurence G., to Engineered Data Products, Inc. Tape cartridge storage system. 4,600,107, Cl. 211-41.000.

Price, Richard P., to Nordson Corporation. Controlled temperature hot melt adhesive dispensing system. 4,600,124, Cl. 222-54.000.

Price, Timothy W., to RCA Corporation. Doubly-balanced mixer termination. 4,601,063, Cl. 455-317.000.

Priddy, Randolph W., to United States of America, Army. Dynamic energy centroid locator and processor (declp). 4,600,305, Cl. 356-152.000.

Prijs, Klaas: *See*—
Damen, Johannes P. M.; Prijs, Klaas; Witmer, Cornelis H. M.; and de With, Gijsbertus, 4,600,957, Cl. 360-120.000.

Prince Corporation: *See*—
Suman, Michael J.; Van Order, Kim L.; Clark, Russell L.; and Haan, Ted W., 4,600,240, Cl. 297-408.000.

Process Engineering Incorporated: *See*—
Girone, Joseph M.; and Dolezal, F. Wesley, 4,599,890, Cl. 73-37.000.

Procter & Gamble Co., The: *See*—
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,600,458, Cl. 156-199.000.

Proctor, Edward A. Process for constructing compact longitudinal concrete. 4,600,459, Cl. 156-212.000.

Provera, Franco: *See*—
Cosentino, Giuseppe; and Provera, Franco, 4,600,808, Cl. 179-2.0DP.

Prusoff, William H.: *See*—
Lin, Tai-Shun; and Prusoff, William H., 4,600,573, Cl. 424-10.000.

Psaar, Hubertus, to Bayer Aktiengesellschaft. Recording material which reacts under the influence of heat, its preparation and the use of acid-modified polymers as acceptors in this recording material. 4,600,930, Cl. 346-201.000.

Psi Star Incorporated: *See*—
Diederich, Perry, 4,600,563, Cl. 422-186.290.

Pucknat, John G.: *See*—
Georgalas, Nick; Pucknat, John G.; and Villano, Ralph R., 4,600,737, Cl. 523-414.000.

Purification Engineering, Inc.: *See*—
Wood, Louis L.; and Calton, Gary J., 4,600,692, Cl. 435-108.000.

Pusch, Rudolf: *See*—
Wegehaupt, Karl-Heinrich; Pusch, Rudolf; and Pfeffer, Hans R., 4,600,657, Cl. 428-447.000.

Qu, Dong-Fen. Tobacco composition with bluish dogbane and a process for the preparation thereof. 4,600,026, Cl. 131-335.000.

Quack, Jochen M.: *See*—
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Quaintance, Benjamin W., to International Paper Company. Reverse elbow lock flap produce box. 4,600,142, Cl. 229-143.000.

Quarterman, Edward A. Wind driven turbine generator. 4,600,360, Cl. 415-2.00A.

Quigley, George W.: *See*—
Chee, Wan T.; and Quigley, George W., 4,600,619, Cl. 428-118.000.

Quinn, Robert L.; Heyman, Philip M.; and Goldman, Abraham, to RCA Corporation. Method for making a protective coating on a machine-readable marking and the product thereof. 4,600,630, Cl. 428-203.000.

Rabaey, Dirk H. L. C., to International Standard Electric Corporation. Switched capacitance feedback control circuit and sigma-delta modulator using same. 4,600,901, Cl. 332-11.00D.

Rabinow, Jacob. Key lock with key isolation. 4,599,877, Cl. 70-366.000.

Racal Data Communications Inc.: *See*—
Kromer, Philip F., III; Srinivasagopalan, Rangarajan; and Fernandez, Raul F., 4,601,044, Cl. 375-17.000.

Rachor, Lothar: *See*—
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, 4,600,610, Cl. 428-2.000.

Raga, Manuel M.: *See*—
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.

Rahaman, Abdul M. Hand grasping member for a garment. 4,599,750, Cl. 2-243.00R.

Rahtz, Dieter: *See*—
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.

Rajala, Gregory J.; and Shavlik, Robert J., to Kimberly-Clark Corporation. Method and device for producing endless synchronous belt with modifed teeth. 4,600,549, Cl. 264-154.000.

Ramsden, Jonathan A.: *See*—
Ingvarsson, Lars I.; and Ramsden, Jonathan A., 4,599,840, Cl. 52-340.000.

Randolph, Robert W., to ACF Industries, Incorporated. Railway hopper gate locking assembly. 4,599,948, Cl. 105-282.00P.

Rass, Hans A. Reflecting badge. 4,600,269, Cl. 350-98.000.

Raue, Roderich: *See*—
Meisel, Karlheinrich; and Raue, Roderich, 4,600,776, Cl. 544-198.000.

Rauls, Richard A. Foldable hunting seat. 4,600,082, Cl. 182-187.000.

Ray, William C., to Allis-Chalmers Corporation. Hydraulic manifold for two and three stage masts. 4,600,084, Cl. 187-9.00E.

Raychem Corporation: *See*—
Debbaut, Christian A. M., 4,600,261, Cl. 339-116.00C.
Howard, Peter, 4,600,804, Cl. 174-84.00C.

Raychok, Paul G., Jr.; and Katt, Linda K. Splint material with hook and loop fastener. 4,600,618, Cl. 428-92.000.

Raymer, Doyle; Eveland, Michael; and Heyden, Dennis J., to King-Seeley Thermos Co. Drainless water cooler. 4,600,148, Cl. 239-29.300.

Raytheon Company: *See*—
Blight, Ronald E., 4,600,906, Cl. 333-205.000.

RCA Corporation: *See*—
Bauer, John A., 4,600,970, Cl. 361-403.000.
Bolger, Thomas V., 4,600,945, Cl. 358-160.000.
Dresner, Joseph, 4,600,935, Cl. 357-58.000.
Hettiger, James, 4,601,062, Cl. 455-285.000.
Hinn, Werner, 4,600,950, Cl. 358-243.000.
Levine, Peter A., 4,600,946, Cl. 358-163.000.
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,600,470, Cl. 156-644.000.
Peterson, Frederick W., 4,599,970, Cl. 118-504.000.
Price, Timothy W., 4,601,063, Cl. 455-317.000.
Quinn, Robert L.; Heyman, Philip M.; and Goldman, Abraham, 4,600,630, Cl. 428-203.000.
White, Lawrence K.; and Miszkowski, Nancy A., 4,600,597, Cl. 427-9.000.
Wine, Charles M., 4,601,060, Cl. 455-192.000.

Reagan, John J.: *See*—
Grellman, H. Erwin; Laakso, Carl W.; Reagan, John J.; and Roland, Leonard A., 4,600,907, Cl. 333-246.000.

Recognition Equipment Incorporated: *See*—
Habitzreiter, Richard K.; Pinney, Robert V., Jr.; and Guthmueller, Rodney K., 4,601,056, Cl. 382-50.000.

Reed Tool Company: *See*—
Gaither, Paul I.; and Tucker, Joseph R., III, 4,599,921, Cl. 82-1.00C.

Reeder, Perry E., to Koch Refining Company. Sulfur oxides scrubbing process. 4,600,567, Cl. 423-242.000.

Reenstra, Arthur L. Thermal cut-off device for packaging machine. 4,599,847, Cl. 53-390.000.

Rees, Karl, to Sulzer Brothers Limited. Combustion chamber for a vapor generator. 4,599,974, Cl. 122-235.00P.

Reeve, Douglas W.; and Tran, Hoc N., to 471199 Ontario Limited. Control of boiler operations. 4,599,975, Cl. 122-379.000.

Regie Nationale des Usines Renault: *See*—
Leorat, Francois; and Pannier, Gerard, 4,599,917, Cl. 74-866.000.

Regruit, Curtis R., to Eastman Kodak Company. Means for stabilizing movement of a flexible disk over a magnetic head. 4,600,955, Cl. 360-99.000.

Reid, Robert F.: *See*—
Cramp, John H. W.; and Reid, Robert F., 4,600,310, Cl. 356-432.000.

Reinhall, Rolf B.; and Johansson, Johan G. I., to Sunds Defibrator Aktiebolag. Refining apparatus with radial passageways for steam recovery. 4,600,475, Cl. 162-261.000.

Reinhart, Karl-Franz: *See*—
Hurst, Kurt; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,600,958, Cl. 360-123.000.

Reinking, Klaus: *See*—
Zecher, Wilfried; and Reinking, Klaus, 4,600,729, Cl. 521-128.000.

Reliance Electric Company: *See*—
Griffen, Neil C.; and Patoray, Stephen A., 4,600,066, Cl. 177-211.000.

Remp, Thomas E.: *See*—
Dreyfuss, Wilfried; Remp, Thomas E.; and Muller, Kurt, 4,599,778, Cl. 29-272.000.

Reng, Alwin: *See—*
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Rengo Co., Ltd.: *See—*
Tokuno, Masateru; and Mori, Yasuharu, 4,600,841, Cl. 250-548.000.

Rennie, George K.: *See—*
Lloyd, John; and Rennie, George K., 4,600,620, Cl. 428-195.000.

Renoult, Patrick; and Marotel, Gerard, to Compagnie d'Electronique et de Piezo-Electricite. Piezoelectric oscillator having filters to prevent unwanted modes. 4,600,900, Cl. 331-116.00R.

Research Corporation: *See—*
Lin, Tai-Shun; and Prusoff, William H., 4,600,573, Cl. 424-10.000.
Liu, Wentai, 4,601,006, Cl. 364-726.000.

Retallick, William B. Hydrogen storage cell. 4,599,867, Cl. 62-48.000.

Reuteler, Johann F.: *See—*
Latzko, Richard I.; Marsland, George H.; and Reuteler, Johann F., 4,599,769, Cl. 29-26.00A.

Reuter, Gerald L.; and Coons, Mark E., to American Home Products Corporation. Propranolol hydrochloride liquid formulations. 4,600,708, Cl. 514-78.000.

Reynold, Timothy; Montgomery, Robert W.; Swaby, Harold; and Garner, Henry C., to British Steel Corporation. Electric arc furnaces. 4,601,042, Cl. 373-93.000.

Reynolds, Gary R.: *See—*
Dunkerton, Stephen H.; Petreye, David R.; Erickson, Gary D.; and Reynolds, Gary R., 4,600,922, Cl. 340-825.440.

Rezmer, Leonard D., to Game Tracker, Inc., The. Bon string changer. 4,599,987, Cl. 124-23.00R.

Rhythm Watch Co., Ltd.: *See—*
Nakamura, Norihiko, 4,600,315, Cl. 368-135.000.

Rice, Joseph E.: *See—*
Okamoto, Yoshiyuki; and Rice, Joseph E., 4,600,784, Cl. 549-39.000.

Richard, Jean-Pierre: *See—*
Bos, Pierre H.; Musseau, Joel R.; and Richard, Jean-Pierre, 4,600,155, Cl. 241-37.500.

Richards, Walter L., to Methane Drainage Ventures. In-shaft drilling method for recovery of gas from subterranean formations. 4,600,061, Cl. 175-62.000.

Richman, Paul, to Standard Microsystems Corporation. Semiconductor integrated circuit structure with selectively modified insulation layer. 4,600,933, Cl. 357-23.120.

Richter Gedeon Veyteszeti Gyar R.T.: *See—*
Seprodi, Janos; Teplan, Istvan; Mezo, Imre; and Erchegyi, Judit, 4,600,705, Cl. 514-15.000.

Richter, Wolfgang: *See—*
Tendulkar, Gautan; Becker, Claus; and Richter, Wolfgang, 4,600,988, Cl. 364-200.000.

Ricoh Co., Ltd.: *See—*
Abe, Michiharu; and Oba, Hideaki, 4,600,625, Cl. 428-167.000.
Fujimura, Itaru; Ide, Yukio; Kageyama, Yoshiyuki; and Kunita, Masako, 4,600,672, Cl. 430-64.000.
Omi, Kyoji, 4,600,266, Cl. 350-3.710.
Seto, Toshio, 4,601,058, Cl. 382-52.000.
Ungemach, Steven R., 4,600,290, Cl. 355-3.0DD.

Ricoh Systems, Inc.: *See—*
Ungemach, Steven R., 4,600,290, Cl. 355-3.0DD.

Ries, Donald G.; and Roof, Glenn L., to Nalco Chemical Company. Choline for neutralizing naphthenic acid in fuel and lubricating oils. 4,600,518, Cl. 252-34.000.

Riggenmann, Hansjurgen, to Gynkotek Gesellschaft fur den Bau wissenschaftlich technischer Gerate m.b.H. Displacement pump for low-pulsation delivery of a liquid. 4,600,365, Cl. 417-246.000.

Rigter, Steven M. Paint applicator. 4,599,762, Cl. 15-248.00A.

Rinke, Robert M., to Adventure Enterprises, Inc. Insertable swimming pool step assembly. 4,599,835, Cl. 52-184.000.

Rist, Wesley G. Pour through beverage chiller. 4,599,872, Cl. 62-399.000.

Roach, Malcolm: *See—*
Van Wormer, Richard A.; Baugh, John L.; Ledet, Charles; and Roach, Malcolm, 4,600,058, Cl. 166-382.000.

Robbins, Frederick M.; Allen, Alfred L.; Walker, John E.; and Cohen, Samuel H., to United States of America, Army. Meat tenderization with a proteolytic enzyme from *Trichoderma reesei*. 4,600,589, Cl. 426-56.000.

Robbins Tire and Rubber Company, Inc.: *See—*
Perdue, Thad A., 4,600,467, Cl. 156-394.100.

Robbins, William M., Jr.: *See—*
Benton, Max D.; and Robbins, William M., Jr., 4,599,832, Cl. 52-118.000.

Robert Bosch GmbH: *See—*
Betz, Dieter, 4,599,985, Cl. 123-622.000.
Hurst, Kurt; Neuffer, Kurt; and Reinhart, Karl-Franz, 4,600,958, Cl. 360-123.000.
Leiber, Heinz, 4,600,244, Cl. 303-111.000.
Lenz, Hans P., 4,599,894, Cl. 73-118.000.
Ziegler, Wolfgang; and Petermann, Hans, 4,599,816, Cl. 40-544.000.

Roberts, Henry J.: *See—*
Groustra, Edward P.; and Roberts, Henry J., 4,599,945, Cl. 102-256.000.

Roberts, James R. Architectural lighting apparatus. 4,600,975, Cl. 362-147.000.

Roberts, Peter C., to Honeywell Inc. Semiconductor memory cell. 4,601,016, Cl. 365-175.000.

Robertson, Brian T., to General Electric Company. Microstrip line. 4,600,663, Cl. 428-632.000.

Robeson, Lloyd M.; and Osborn, Claiborn L., to Union Carbide Corporation. Ultraviolet light stabilized polyarylate containing article. 4,600,647, Cl. 428-412.000.

Robinson, Brian W. Breakdance apparel. 4,599,747, Cl. 2-16.000.

Robinson, Douglas A.: *See—*
Salpekar, Anil M.; Freebersyser, Steven R.; and Robinson, Douglas A., 4,600,579, Cl. 424-80.000.

Robinson, Gordon D., to Cirrus Computers Ltd. Test-generation system for digital circuits. 4,601,032, Cl. 371-23.000.

Robinson, John W.: *See—*
Diephouse, Tim R.; LaTulip, Randy J.; Robinson, John W.; and Gantt, Gary R., 4,600,767, Cl. 528-252.000.

Rocket Research Company, a division of Rockor, Inc.: *See—*
Galbraith, Lyle D., 4,600,123, Cl. 222-3.000.

Rockwell International Corporation: *See—*
Alitz, Orville J.; and Moos, David P., 4,600,925, Cl. 343-5.0SA.
Hardt, Ivan E.; Bonebright, Cynthia A.; and Fuller, Ray C., 4,601,043, Cl. 375-1.000.
Huffman, Charles E.; and Pepmiller, Paul E., 4,601,028, Cl. 370-15.000.
Lienert, Gerold, 4,599,879, Cl. 72-53.000.
Waite, Thomas R., 4,600,308, Cl. 356-363.000.

Rockwell-Rimoldi S.p.A.: *See—*
Brusasca, Gianfranco; and Garzulano, Franco, 4,599,960, Cl. 112-287.000.
Brusasca, Gianfranco; and Garzulano, Franco, 4,599,961, Cl. 112-287.000.
Marcandalli, Ulderico, 4,599,957, Cl. 112-199.000.

Roda Holding Anstalt: *See—*
Bachmann, Wolfgang; Spahn, Dieter; and Nuss, Lothar, 4,599,881, Cl. 72-128.000.

Roesel, John F., Jr.; and Barber, Ronnie J., to Precise Power Corporation. Synchronous A.C. motor. 4,600,873, Cl. 318-701.000.

Rogers, Donald D.: *See—*
Stewart, Denzil S.; Bland, Alfred J.; and Rogers, Donald D., 4,600,205, Cl. 280-95.00R.

Rohm and Haas Company: *See—*
Martin, Frank W.; and Shahbazi, Samson, 4,600,602, Cl. 427-96.000.

Rohrbacher, William H. Apparatus and method of adding a passenger compartment to a mini-truck or a similar structure. 4,599,780, Cl. 29-401.100.

Rohrer, Hermann, to Sipuro A.G. Cleanser container. 4,600,128, Cl. 222-108.000.

Rohrig, Harald; and Rudolf, Gunther, to INA Walzlager Schaeffler KG. Polymeric component. 4,600,333, Cl. 403-259.000.

Roland, Leonard A.: *See—*
Grellman, H. Erwin; Laakso, Carl W.; Reagan, John J.; and Roland, Leonard A., 4,600,907, Cl. 333-246.000.

Rolm Corporation: *See—*
Graham, Martin H., 4,600,982, Cl. 363-61.000.

Rom, Rudolph A., to Lockformer Company, The. Fiberboard cutting system. 4,599,925, Cl. 83-56.000.

Romada Holdings Ltd.: *See—*
Smith, Dennis C.; and Maijer, Rolf, 4,600,383, Cl. 433-9.000.

Roof, Glenn L.: *See—*
Ries, Donald G.; and Roof, Glenn L., 4,600,518, Cl. 252-34.000.

Roof, William M.; and Blair, Dennis P., to Thoroughbred Plastics Corp. Pourout fitment/closure. 4,600,131, Cl. 222-478.000.

Roquette Freres: *See—*
Schneider, Jean; Gosset, Serge; and Lefer, Pierre, 4,600,439, Cl. 106-139.000.

Rose, Harry A.: *See—*
Engel, Gary L.; Indelicato, Joseph M.; and Rose, Harry A., 4,600,773, Cl. 544-30.000.

Rose, William H.; and Shaffer, David T., to AMP Incorporated. Lead frames with dielectric housings molded thereon. 4,600,971, Cl. 361-421.000.

Rosell, Jorge E., to Bendiberica S.A. Compact assisted steering mechanism for an automotive vehicle. 4,599,911, Cl. 74-388.0PS.

Rosenberg, Harry, to Gewerkschaft Eisenhutte Westfalia. Mine roof support unit. 4,600,340, Cl. 405-297.000.

Rosenberg, Helmut W. G., to Kendall Company, The. Catheter with locking device. 4,600,402, Cl. 604-96.000.

Rosenthal, Richard L., to United States of America, Army. Digital technique for constructing variable width lines. 4,601,002, Cl. 364-518.000.

Rosenwinkel, Donald A.; and Disko, Harry, to Marvin Glass & Associates. Portable self-contained light box drawing toy. 4,600,393, Cl. 434-88.000.

Ross, James W.: *See—*
Bromberg, Edward E. A.; Diggens, Albert; West, Steven J.; and Ross, James W., 4,600,494, Cl. 204-401.000.

Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., to General Dynamics, Pomona Division. Separable high pressure gas line isolator. 4,600,218, Cl. 285-50.000.

Ross, Robert A. Rubber dam frame for dental work. 4,600,387, Cl. 433-136.000.

Rotello, Gregory A. Method and apparatus to determine frequency of movement and for visual inspection of moving objects. 4,600,300, Cl. 356-23.000.

Rousseau, Jean L., to Boussac Saint-Freres B.S.F. Easy to put on wrap-around shoe which is adaptable to the shape of the foot. 4,599,811, Cl. 36-105.000.

Rudolf, Gunther: *See—*
Rohrig, Harald; and Rudolf, Gunther, 4,600,333, Cl. 403-259.000.

Ruffner, Charles G.; and Wilkerson, John M., III, to Alco Chemical Corporation. Acrylic emulsion copolymers for thickening aqueous systems and copolymerizable surfactant monomers for use therein. 4,600,761, Cl. 526-270.000.

Rugen, Thomas W., to Motorola, Inc. Coherent oscillator. 4,600,889, Cl. 329-50.000.

Runzheimer, Hans-Volker: *See*—
Bergthaller, Peter; Strauss, Jurgen; Runzheimer, Hans-Volker; and Wolfrum, Gerhard, 4,600,681, Cl. 430-242.000.

Rushe, Eugene T.: *See*—
Wang, Ke-Chin; Rushe, Eugene T.; and Winkelbauer, Howard M., 4,600,607, Cl. 427-421.000.

Ryan, Carl R. Serial minimum shift-keyed modem. 4,601,048, Cl. 375-47.000.

Ryder, Amy L.: *See*—
Baillie, Lloyd A.; and Ryder, Amy L., 4,600,410, Cl. 55-1.000.

Ryder, Francis E.; and Williams, Fred E., Jr., to Ryder International Corporation. Collapsible painting cart. 4,599,968, Cl. 118-305.000.

Ryder International Corporation: *See*—
Ryder, Francis E.; and Williams, Fred E., Jr., 4,599,968, Cl. 118-305.000.

S.A.R.L. Dite Industrielle Francaise de Mecanique Flambeau: *See*—
Pateras Pescara de Castelluccio, Christian, 4,599,889, Cl. 73-23.000.

Sabo, Michael K.; and Johnson, Gary R., to Abbott Laboratories. Magazine for dispensing cartridges into an automated analyzer. 4,600,120, Cl. 221-107.000.

Sacre, Guillaume, to W. L. Gore & Associates. Waterproof shoe construction. 4,599,810, Cl. 36-55.000.

Sacristan, Aurelio: *See*—
Foguet, Rafael; Anglada, Luis; Raga, Manuel M.; Ortiz, Jose A.; Sacristan, Aurelio; and Castello, Jose M., 4,600,780, Cl. 548-193.000.

Sage, Burton H., Jr., to Becton, Dickinson and Company. Flow cytometry apparatus with uniform incoherent light excitation. 4,600,302, Cl. 356-39.000.

Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, to Matsushita Electric Industrial Co., Ltd. Voice analysis composing method. 4,601,052, Cl. 381-51.000.

Saito, Keiichiro: *See*—
Fujine, Sachio; Saito, Keiichiro; and Shiba, Koreyuki, 4,600,566, Cl. 423-179.500.

Saito, Shiuji: *See*—
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, 4,600,540, Cl. 558-255.000.

Saito, Taizo, to Ashai Optical Co., Ltd. Lens cap. 4,600,278, Cl. 350-587.000.

Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member having light receiving layer of A-(Si-Ge) and N. 4,600,671, Cl. 430-57.000.

Saka, Kazuhiko: *See*—
Tsuji, Shuji; Ito, Hiroshi; and Saka, Kazuhiko, 4,601,057, Cl. 382-51.000.

Sakai, Takami; and Imai, Koji, to Kabushiki Kaisha Toshiba. Margin angle responsive method and apparatus for controlling reactive power in a HVDC system. 4,600,981, Cl. 363-35.000.

Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, to Sony Corporation. Scrambling system for audio frequency signals. 4,600,941, Cl. 358-121.000.

Sakano, Kozaburo: *See*—
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,600,648, Cl. 428-412.000.

Salas, Edward R.: *See*—
Boudreau, Daniel A.; and Salas, Edward R., 4,600,992, Cl. 364-200.000.

Salk Institute Biotechnology/Industrial Associates, Inc., The: *See*—
Kaiser, Emil T.; and Musso, Gary F., 4,600,532, Cl. 260-998.210.

Salomon, Hans G.: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Salpekar, Anil M.; Freebersyser, Steven R.; and Robinson, Douglas A., to Mallinckrodt, Inc. N-acetyl-p-aminophenol compositions containing partially gelatinized starch and method for preparing same. 4,600,579, Cl. 424-80.000.

Samaan, Samir; and Horstmann, Harald, to Bayer Aktiengesellschaft. Process for preparing acemetacin. 4,600,783, Cl. 548-501.000.

Samaritoni, Jack G.: *See*—
Abdulla, Riaz F.; and Samaritoni, Jack G., 4,600,430, Cl. 71-92.000.

Samueli, Samuel. Multiple intersection dripper. 4,600,152, Cl. 239-542.000.

Sanden Corporation: *See*—
Terauchi, Kiyoshi; Kubo, Yasuhiro; and Hiraga, Masaharu, 4,600,367, Cl. 417-360.000.

Sanders Associates, Inc.: *See*—
Burrows, James L., 4,600,846, Cl. 307-465.000.

Sanders, Ronald J., to Weather Ready Inc. Storage battery heat maintenance apparatus. 4,600,665, Cl. 429-120.000.

Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, to Eltech Systems Corporation. Aluminum production cell components. 4,600,481, Cl. 204-67.000.

Sangamo Weston, Inc.: *See*—
Horwitz, Lawrence B.; and Wiggins, Eugene T., 4,601,047, Cl. 375-2.200.

Sano, Yasuo: *See*—
Arita, Kazuhiro; Masuda, Isao; and Sano, Yasuo, 4,600,766, Cl. 528-207.000.

Sano, Yasuro; and Murakami, Eiji, to Janome Sewing Machine Industry Co., Ltd. Method of producing patterns of zigzag stitches. 4,599,959, Cl. 112-266.100.

Santamaria, George T., to Lucidyne, Inc. Pulsed power supply for an electrostatic precipitator. 4,600,411, Cl. 55-139.000.

Santos, Joseph T.; and Meyer, Robert G., to University of California, The Regents of the. One-pin crystal oscillator. 4,600,898, Cl. 331-116.0FE.

Santurtun, Carlos M.; and Carmena, Angel D., to General Electric Company. Protective circuit for X-ray generator. 4,601,051, Cl. 378-118.000.

Sanwa Shoji Co., Ltd.: *See*—
Higashi, Takehiro; Kobori, Michio; Yoshino, Zenichi; and Morimoto, Seiichi, 4,600,477, Cl. 203-26.000.

Sanyo Electric Co., Ltd.: *See*—
Deguchi, Yutaka; and Shibata, Yoshitaka, 4,600,822, Cl. 219-10.55A.
Hiejima, Kiyoshi, 4,600,823, Cl. 219-10.770.
Sato, Hironobu, 4,600,864, Cl. 318-254.000.

Sartor, Mariano. Rake adjusting device for the leg portion of a ski boot. 4,599,813, Cl. 36-117.000.

Sarver, Ronald D. Board mat system. 4,600,337, Cl. 404-35.000.

Sasaki, Atsushi; Ohsaka, Hiromi; Murakami, Mitsuharu; Harada, Masahiro; Hatano, Hirofumi; and Hirota, Yoji, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Mining & Cement Co., Ltd. Cyclone. 4,600,417, Cl. 55-413.000.

Sasaki, Takao: *See*—
Nozawa, Ryoichiro; Kawamura, Hideaki; Sasaki, Takao; and Hirose, Satoru, 4,600,985, Cl. 364-169.000.

Sasatani, Yukihiro, to Sumitomo Electric Industries, Ltd. Method of manufacturing a light emitting semiconductor device. 4,599,787, Cl. 29-569.00L.

Sato, Hironobu, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Easily restarted brushless DC motor. 4,600,864, Cl. 318-254.000.

Sato, Kimiaki: *See*—
Mochizuki, Hirohiko; Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,601,017, Cl. 365-189.000.

Sato, Mikio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.

Sato, Naoki; Kamo, Yoshihisa; Katoh, Yasuhiro; Momata, Kazuhiro; and Arai, Shinichi, to Hitachi, Ltd. Current driving circuit. 4,600,965, Cl. 361-153.000.

Sato, Nobuo, to NGK Insulators, Ltd. Plate filter press. 4,600,509, Cl. 210-230.000.

Sato, Takashi; Ozawa, Tsutomu; and Minamida, Katsuhiro, to Nippon Steel Corporation. Method for continuous casting of metal strip. 4,600,048, Cl. 164-463.000.

Saunders, Margaret H.: *See*—
Maynard, Richard B.; Moscony, John J.; and Saunders, Margaret H., 4,600,470, Cl. 156-644.000.

Saunier, Paul: *See*—
Kim, Bumman; and Saunier, Paul, 4,599,790, Cl. 29-571.000.

Sawyer, Constance B.: *See*—
Kindle, Karen L.; Mainzer, Stanley E.; Marlatt, Deborah L.; and Sawyer, Constance B., 4,600,693, Cl. 435-176.000.

Sayed, Aziz E.: *See*—
Dicke, Hans-Rudolf; Bottenbruch, Ludwig; Freitag, Dieter; and Sayed, Aziz E., 4,600,764, Cl. 528-128.000.

Scales, Stanley R.; Shotwell, Duane E.; and Atkinson, Gerald O., to Hughes Tool Company. Earth boring bit with bearing sleeve. 4,600,064, Cl. 175-368.000.

Scarr, Robert W. A.; and Bingham, John, to International Standard Electric Corporation. Optical FDM system. 4,601,027, Cl. 370-3.000.

Schaeffler, Arthur; and Werner, Klemens, to MTU Motoren - und Turbinen-Union Muenchen GmbH. Flexible brush-type seal with layered moving sealing surface. 4,600,202, Cl. 277-53.000.

Schaus, John M.: *See*—
Huser, Diane L.; Schaus, John M.; Titus, Robert D.; and Weigel, Leland O., 4,600,777, Cl. 546-164.000.

Scheible, Eberhard, to EM-GE Sportgerate GmbH & Co., KG. Signal pistol. 4,599,817, Cl. 42-1.150.

Schenker, Bruce R. Step exerciser. 4,600,187, Cl. 272-70.000.

Schenker, Karl; and Bernasconi, Raymond, to Ciba Geigy Corporation. Tetrahydropyridine and piperidine derivatives. 4,600,719, Cl. 514-320.000.

Scheuneman, James H.; and Michaelson, Wayne A., to Sperry Corporation. Pipelined split stack with high performance interleaved decode. 4,600,986, Cl. 364-200.000.

Schickaneder, Helmut: *See*—
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.

Schluessler, Hans-Joachim: *See*—
Piorr, Robert; Schluessler, Hans-Joachim; and Nikolaus, Peter, 4,600,523, Cl. 252-174.220.

Schlumberger Technology Corporation: *See*—
Steinman, Donald K.; and Jacobson, Larry A., 4,600,838, Cl. 250-270.000.

Schmid, Rainer, to Orthopedic Design, Inc. Power grip insert. 4,599,920, Cl. 81-489.000.

Schmidt, Albert: *See*—
Gobel, Roland; Musil, Rudolf; Tiller, Hans-Jurgen; Oppawsky, Steffen; Schmidt, Albert; and Janda, Rolf, 4,600,390, Cl. 433-218.000.

Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., to United States of America, Energy. Copper-tantalum alloy. 4,600,448, Cl. 148-407.000.

Schmidt, Glenn H. Sectioned ski. 4,600,211, Cl. 280-603.000.

Schmidt-Hansberg, Thomas: *See*—
Hrovat, Milan; Huschka, Hans; Rachor, Lothar; Schmidt-Hansberg, Thomas; and Kroebel, Reinhard, 4,600,610, Cl. 428-2.000.

Schmidt, Richard G. Instrument for removing foreign substances from the eye. 4,600,008, Cl. 128-357.000.

Schmiechen, Ralph: *See*—
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.

Schmitt, Roland: *See*—
Horn, Falk R.; Schmitt, Roland; Gurr, Manfred; and Grimm, Rolf, 4,600,623, Cl. 428-151.000.

Schmukler, Seymour; Shida, Mitsuzo; and Machonis, John, Jr., to Norchem, Inc. Polyvinyl alcohol alloys and method of making the same. 4,600,746, Cl. 525-57.000.

Schmutz, Beat: *See*—
Boschung, Marcel; and Schmutz, Beat, 4,600,842, Cl. 250-577.000.

Schneider, Gerhart: *See*—
Wester, Norbert; Uhl, Klaus; Gulden, Walter; and Schneider, Gerhart, 4,600,516, Cl. 252-8.55R.

Schneider, Jean; Gosset, Serge; and Lefer, Pierre, to Roquette Freres. Composition and process for coating paper and cardboard process for preparing the compositions and paper and cardboard so obtained. 4,600,439, Cl. 106-139.000.

Schneiter, John L.: *See*—
Sheridan, Thomas B.; and Schneiter, John L., 4,599,908, Cl. 73-862.040.

Schonberger, Franz; Stadlmeier, Hans; Brunner, Reinhold; and Wagner, Wolfgang, to Siemens Aktiengesellschaft. Integrated microprogrammed device for controlling information processing cycles, and a method for operating the same. 4,600,991, Cl. 364-200.000.

Schossler, Willi, to Bayer Aktiengesellschaft. Process for the preparation of nitroaminobenzenes. 4,600,797, Cl. 564-414.000.

Schramm, George W.: *See*—
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.

Schrewe, Manfred: *See*—
Cramer, Wilhelm; and Schrewe, Manfred, 4,600,664, Cl. 429-7.000.

Schroeck, Joseph P.: *See*—
Hicks, Irwin A.; and Schroeck, Joseph P., 4,600,923, Cl. 340-870.020.

Schroeppel, Edward A., to Cordis Corporation. Pacing lead with sensor. 4,600,017, Cl. 128-784.000.

Schubert & Salzer: *See*—
Hackenberg, Willi, 4,600,817, Cl. 191-12.00C.

Schuchardt, James M.: *See*—
Califano, Herbert T.; Schuchardt, James M.; and Spindler, Gotthard K., 4,600,166, Cl. 244-3.160.

Schulz, Lowell V. Trash can retainer. 4,600,109, Cl. 211-71.000.

Schumacher, Ignatius, to Monsanto Company. Vapor phase nitration catalysts. 4,600,702, Cl. 502-200.000.

Schwarting, Fritz: *See*—
Zucker, Stanley; and Schwarting, Fritz, 4,600,178, Cl. 256-1.000.

Schwartz, Abraham, to Magnetic Activated Particle Sorting, Inc. Dental restoration method and composition therefor. 4,600,389, Cl. 433-217.100.

Schwartz, Bertram: *See*—
Focht, Marlin W.; Koszi, Louis A.; and Schwartz, Bertram, 4,599,791, Cl. 29-576.00B.

Schwartz, Marc D.; and Sura, Christopher B., to CAVRI Systems, Inc. Universal computer, recorded video interface. 4,600,989, Cl. 364-200.000.

Schwenninger, Ronald L., to PPG Industries, Inc. Metering device for molten glass and the like. 4,600,426, Cl. 65-330.000.

Schwensfeir, Robert J., Jr.: *See*—
Trenkler, George; Delagi, Richard; Britton, Charles; and Schwensfeir, Robert J., Jr., 4,599,771, Cl. 29-155.00R.

Sciaky, Mario; Leonard, Michel; Jablonski, Pierre; and Marianne, Jean-Jacques, to Sciaky S.A. Installation for assembling and in particular pinning car bodies of motor vehicles. 4,600,136, Cl. 228-45.000.

Sciaky S.A.: *See*—
Sciaky, Mario; Leonard, Michel; Jablonski, Pierre; and Marianne, Jean-Jacques, 4,600,136, Cl. 228-45.000.

SCM Corporation: *See*—
Winner, Peter P., 4,600,754, Cl. 525-531.000.

Scott, Gary C.; and Gibson, Arthur W. Wood stacking device and method of stacking wood. 4,600,108, Cl. 211-49.100.

Scott, Michael G., to Standard Telephone & Cables. Method for making and coating optical fibres. 4,600,422, Cl. 65-3.300.

Scriptel Corporation: *See*—
Kable, Robert G., 4,600,807, Cl. 178-19.000.

Scrivo, Jerry V., to Ex-Cell-O Corporation. Impingement mix-head for rim process. 4,600,312, Cl. 366-159.000.

Scully, John P.; and Ward, Richard. Water moisture measuring instrument and method. 4,600,879, Cl. 324-58.50A.

Sealock, L. John, Jr.: *See*—
Hallen, Richard T.; and Sealock, L. John, Jr., 4,600,529, Cl. 252-373.000.

Sedlmair, Gerhard; and Knabel, Walter, to Marker International Company. Safety ski-binding having a sole plate. 4,600,213, Cl. 280-618.000.

Seelman, Hans H., to Linde Aktiengesellschaft. Controls for the drive of a vehicle with differential speed steering. 4,599,855, Cl. 60-421.000.

Segredo, Anthony F.; Prendergast, Richard E.; Martin, Ralph E.; and Pluister, Jack W., to Continental Can Company, Inc. Double seam tightness monitor. 4,600,347, Cl. 413-26.000.

Seidelmann, Dieter: *See*—
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.

Seifert, Dexter C.: *See*—
Basalyk, Peter I.; Lukco, Dorothy; Mooney, J. Robert; and Seifert, Dexter C., 4,600,443, Cl. 134-3.000.

Seiko Epson Corporation: *See*—
Morozumi, Shinji, 4,600,274, Cl. 350-339.00F.
Ohno, Yoshihiro, 4,600,273, Cl. 350-336.000.

Seipel, Thomas E.: *See*—
Mengel, Ronald E.; and Seipel, Thomas E., 4,600,160, Cl. 241-282.200.

Seith, Nancy; and Johnson, Robert C. Leg manipulating device. 4,599,996, Cl. 128-25.00R.

Seki, Nagataka; Koike, Shunichi; and Watanabe, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Gate-turn-off thyristor failure detecting circuit. 4,600,917, Cl. 340-645.000.

Sekine, Yoshitada; and Yokota, Fumiki, to Nissan Motor Company, Limited. Method and device for inputting co-ordinates for robot. 4,600,869, Cl. 318-568.000.

Sekiya, Tsuneto; Matsuura, Osamu; and Huruhata, Shooichi, to Fuji Electric Co., Ltd. Semiconductor device package having regions of different thermal properties. 4,600,968, Cl. 361-394.000.

Selecman, Charles E., to Spinks Industries, Inc. Ground handling apparatus for a helicopter. 4,600,168, Cl. 244-50.000.

Sels, Francis J.; Paulussen, Josephus F.; and Pollet, Robert J., to Agfa-Gevaert, N.V. Stripping aids for cellulose ester film. 4,600,552, Cl. 264-300.000.

Sember, James W.: *See*—
Tupper, Leland C.; Walker, Loren H.; Weiss, Herbert W.; and Sember, James W., 4,600,874, Cl. 318-798.000.

Senoh, Shikazo: *See*—
Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, 4,600,749, Cl. 525-314.000.

Sentec Inc.: *See*—
Bliehall, James C., 4,600,962, Cl. 361-77.000.

Seprodi, Janos; Teplan, Istvan; Mezo, Imre; and Erchegyi, Judit, to Richter Gedeon Veyteszeti Gyar R.T. Gonadoliberin derivatives containing a β-aspartyl group, a process for the preparation thereof and pharmaceutical preparations containing them. 4,600,705, Cl. 514-15.000.

Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, to Ayerst, McKenna & Harrison, Inc. N-naphthoylglycine derivatives. 4,600,724, Cl. 514-510.000.

Seto, Kaoru, to Canon Kabushiki Kaisha. Motor revolution speed control device. 4,600,866, Cl. 318-313.000.

Seto, Toshio, to Ricoh Company, Ltd. Image reader for facsimile apparatus or the like. 4,601,058, Cl. 382-52.000.

Setter, Ronald E.: *See*—
Frederick, Dennis R.; and Setter, Ronald E., 4,600,235, Cl. 296-106.000.

S+G Implants GmbH: *See*—
Grundei, Hans, 4,600,546, Cl. 264-59.000.

Shaffer, David T.: *See*—
Rose, William H.; and Shaffer, David T., 4,600,971, Cl. 361-421.000.

Shah, Ashwin H.; Gallia, James D.; Wang, I-Fay; and Mahant-Shetti, Shivaling S., to Texas Instruments Incorporated. Memory with redundancy. 4,601,019, Cl. 365-200.000.

Shahbazi, Samson: *See*—
Martin, Frank W.; and Shahbazi, Samson, 4,600,602, Cl. 427-96.000.

Shaparew, Vladimir. Pollen trap. 4,599,757, Cl. 6-4.00R.

Sharp, John B.: *See*—
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.

Sharp, William F.; Banker, John G.; and Hardwick, Roy, to Explosive Fabricators, Inc. Aluminum/titanium transition joint between aluminum and steel bodies. 4,600,332, Cl. 403-179.000.

Shavlik, Robert J.: *See*—
Rajala, Gregory J.; and Shavlik, Robert J., 4,600,549, Cl. 264-154.000.

Shearer, Francis R.: *See*—
Garcia, Ruben C., 4,599,748, Cl. 2-22.000.

Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., to Kimberly-Clark Corporation. Heat sealable water dispersible adhesive. 4,600,404, Cl. 604-387.000.

Shell Oil Company: *See*—
Chadwick, John C.; and Goodall, Brian L., 4,600,757, Cl. 526-142.000.
Ellison, Robert H.; and Friend, Peter S., 4,600,800, Cl. 568-832.000.
Haken, Pieter T.; and Webb, Shirley B., 4,600,712, Cl. 514-188.000.

Shen, Liang C.: *See*—
Baldwin, Willett F.; and Shen, Liang C., 4,600,887, Cl. 324-333.000.

Shen, Steve S.: *See*—
Hong, Jauwhei; Jens, Richard A.; Shen, Steve S.; and Manson, Earle L., Jr., 4,600,659, Cl. 428-471.000.

Shepard, Francis H., Jr. Apparatus for variable speed drive of an induction motor from a fixed frequency AC source. 4,600,872, Cl. 318-658.000.
Sheridan, Thomas B.; and Schneiter, John L. Opto-mechanical touch sensor. 4,599,908, Cl. 73-862.040.
Shering Aktiengesellschaft: *See*—
Huth, Andreas; Schmiechen, Ralph; Seidelmann, Dieter; Rahtz, Dieter; Engelstoft, Mogens; and Braestrup, Claus T., 4,600,715, Cl. 514-222.000.
Sherman, Victor L.; and Pincers, Ojars W., to Allomatic Industries, Inc. Two-layer fluid filter with spacer. 4,600,511, Cl. 210-316.000.
Shiba, Koreyuki: *See*—
Fujine, Sachio; Saito, Keiichiro; and Shiba, Koreyuki, 4,600,566, Cl. 423-179.500.
Shibata, Hiroshi; Toyoda, Hiroyasu; and Nakata, Hidefumi, to Mitsubishi Denki Kabushiki Kaisha. Solid state image sensing device with a color filter. 4,600,833, Cl. 250-216.000.
Shibata, Yoshitaka: *See*—
Deguchi, Yutaka; and Shibata, Yoshitaka, 4,600,822, Cl. 219-10.55A.
Shibuya, Hideo: *See*—
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.
Shida, Mitsuzo: *See*—
Schmukler, Seymour; Shida, Mitsuzo; and Machonis, John, Jr., 4,600,746, Cl. 525-57.000.
Shih, David H.: *See*—
Christensen, Burton G.; and Shih, David H., 4,600,713, Cl. 514-210.000.
Shillington, Richard A.; and Oberschmidt, Alec, to Med-Safe Systems, Inc. One-way pass-through closure. 4,600,112, Cl. 215-274.000.
Shimizu, Atsushi; and Ohtsubo, Sadami, to Terumo Kabushiki Kaisha. Filter device for liquids. 4,600,507, Cl. 210-94.000.
Shimizu, Motoharu, to Hitachi Metals, Ltd. Method of producing a cylindrical permanent magnet. 4,600,555, Cl. 419-5.000.
Shimojo, Tetsuji: *See*—
Harada, Mineo; Shimojo, Tetsuji; and Furuya, Kaname, 4,600,323, Cl. 400-124.000.
Shimomukai, Eishu: *See*—
Fujita, Sadao; Toyokawa, Akira; Mutoh, Shinichiro; Shimomukai, Eishu; and Ueda, Kenji, 4,600,378, Cl. 432-8.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Ohno, Shigeru, 4,600,146, Cl. 239-6.000.
Shindo, Osamu: *See*—
Tokutomi, Seijiro; Shindo, Osamu; and Yuda, Hideaki, 4,600,830, Cl. 250-201.000.
Shinozaki, Kaoru: *See*—
Kawakatsu, Satoshi; Nakayama, Noritaka; Katoh, Katsunori; Shinozaki, Kaoru; and Kimura, Toshihiko, 4,600,688, Cl. 430-558.000.
Shinozuka, Takashi: *See*—
Hayashi, Takao; Arai, Masanobu; and Shinozuka, Takashi, 4,600,811, Cl. 179-16.0AA.
Shiokawa, Kozo; Kagabu, Shinzo; and Moriya, Koichi, to Nihon Tokushu Noyaku Seizo K.K. Preparation of biphenylylsulfonylureas and intermediates therefor. 4,600,792, Cl. 560-12.000.
Shiozaki, Hiroyuki: *See*—
Kato, Heiji; and Shiozaki, Hiroyuki, 4,599,770, Cl. 29-113.00R.
Shipley, Robert T., to Fisher Berkeley Corporation. Communication system. 4,601,064, Cl. 455-608.000.
Shirahata, Ryuji: *See*—
Ishikuro, Tadashi; Shirahata, Ryuji; Miyoshi, Takahito; and Fujiyama, Masaaki, 4,600,638, Cl. 428-323.000.
Shiraishi, Hisashi: *See*—
Ogawa, Masashi; Shiraishi, Hisashi; and Ikeda, Teppei, 4,600,641, Cl. 428-355.000.
Shivvers, Incorporated: *See*—
Parkes, Donald H., 4,599,809, Cl. 34-31.000.
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, Fumikazu; and Ohguchi, Masakatsu, to Toyo Boseki Kabushiki Kaisha. Antistatic fiber containing polyoxyalkylene glycol. 4,600,743, Cl. 524-377.000.
Shoemaker, John B., to PPG Industries, Inc. Textile bobbin. 4,600,165, Cl. 242-118.400.
Short, Roger V.; and Armstrong, Stuart, to Monash University. Method for minimizing disturbances in circadian rhythms of bodily performance and function. 4,600,723, Cl. 514-416.000.
Shotwell, Duane E.: *See*—
Scales, Stanley R.; Shotwell, Duane E.; and Atkinson, Gerald O., 4,600,064, Cl. 175-368.000.
Shumaker, Wayne G., to Motorola, Inc. Broken loop switched capacitor high pass filter. 4,600,904, Cl. 333-173.000.
Shuttleworth, John: *See*—
Burkholder, Dennis L., 4,600,216, Cl. 280-772.000.
Shyu, Wen-Bin: *See*—
Lee, Chi-long; and Shyu, Wen-Bin, 4,600,751, Cl. 525-404.000.
Sickles, Willard J., to InterMetro Industries Corp. Carrier for self-supporting sheet-like articles such as printed circuit boards. 4,600,231, Cl. 294-161.000.
Sieloff, Gloria M.: *See*—
Lee, David M.; Hutchings, David A.; Sieloff, Gloria M.; and Willard, G. Fred, 4,600,765, Cl. 528-193.000.
Siemens Aktiengesellschaft: *See*—
Dangschat, Rainer, 4,600,948, Cl. 358-190.000.
Doemens, Guenter; and Mengel, Peter, 4,600,878, Cl. 324-51.000.
Dost, Willibald; Habenschaden, Kurt; Kreutzer, Hans; and Wasner, Gunter, 4,600,272, Cl. 350-287.000.
Pammer, Erich; and Bischofberger, Otfried, 4,600,600, Cl. 427-89.000.
Schonberger, Franz; Stadlmeier, Hans; Brunner, Reinhold; and Wagner, Wolfgang, 4,600,991, Cl. 364-200.000.
Tendulkar, Gautan; Becker, Claus; and Richter, Wolfgang, 4,600,988, Cl. 364-200.000.
Wilhelm, Wilhelm; and Incecik, Zafer, 4,601,049, Cl. 377-115.000.
Siemens Corporate Research & Suppport, Inc.: *See*—
Whelan, Michael, 4,601,033, Cl. 371-25.000.
Sievers, Richard W., to Thermodynetics Inc. Method of forming a multiple coil heat exchanger. 4,599,773, Cl. 29-157.30R.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Kopp, Georg, 4,599,850, Cl. 53-451.000.
Sigel, George H., Jr.: *See*—
Koo, Kee P.; Dandridge, Anthony; Tveten, Alan B.; and Sigel, George H., Jr., 4,600,885, Cl. 324-244.000.
Sigma Tau Industrie Farmaceutiche Riunite S.P.A.: *See*—
Tinti, Maria O., 4,600,794, Cl. 562-567.000.
Simmonds S.A.: *See*—
Frerejacques, Jean-Claude, 4,600,343, Cl. 411-303.000.
Sims, Roy M.: *See*—
Krumwiede, John F.; Hilliard, William G.; and Sims, Roy M., 4,600,425, Cl. 65-178.000.
Sinclair, John C.: *See*—
Hudson, Michael J.; and Sinclair, John C., 4,599,878, Cl. 72-19.000.
Sindlinger, Ronald E., to GTE Products Corporation. Fluorescent lamp circuit breaker. 4,600,861, Cl. 315-73.000.
Singer Company, The: *See*—
Galuschak, George; and Stomber, Richard J., 4,599,803, Cl. 33-301.000.
Sipuro A.G.: *See*—
Rohrer, Hermann, 4,600,128, Cl. 222-108.000.
Siuta, Vincent P., to Du Pont de Nemours, E. I., and Company. Metal oxide-coated copper powder. 4,600,604, Cl. 427-216.000.
Sivulka, Gerald M.: *See*—
Bruder, John R.; Sivulka, Gerald M.; and Tribe, Leonard T., 4,600,820, Cl. 200-84.00C.
Sixsmith, Thomas. Interior storm window. 4,599,825, Cl. 49-466.000.
Slominski, Leo J.: *See*—
Leever, Harold; and Slominski, Leo J., 4,600,609, Cl. 427-438.000.
Slusarek, William L.: *See*—
Jero, John P.; Loda, Michael A.; and Slusarek, William L., 4,599,899, Cl. 73-584.000.
Sluyter, Erik; and Wooff, Edward A., Jr., to Circon Corporation. Focusable video camera for use with endoscopes. 4,600,938, Cl. 358-98.000.
Sluyter, Erik; and Wooff, Edward A., Jr., to Circon Corporation. Focusable video camera for use with endoscopes. 4,600,939, Cl. 358-98.000.
Sluyter, Erik, to Circon Corporation. Video camera for use with an endoscope and method for making same. 4,600,940, Cl. 358-98.000.
Smernoff, Ronald B., to Analytical Products, Inc. Apparatus and process for equilibrating gas and liquid. 4,600,697, Cl. 436-174.000.
Smillie, Allan M.: *See*—
Kleimeyer, David L.; Fletcher, Larry N.; Stacy, Alan D.; and Smillie, Allan M., 4,600,434, Cl. 75-58.000.
Smith, Arnold L.: *See*—
Eccardt, Curtis J.; and Smith, Arnold L., 4,599,927, Cl. 83-473.000.
Smith, Dennis C.; and Maijer, Rolf, to Dennis Smith Consulting Limited; and Romada Holdings Ltd. Bonding to calcified tissues. 4,600,383, Cl. 433-9.000.
Smith, Jerry H.: *See*—
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., 4,600,740, Cl. 524-120.000.
Smith Kline & French Laboratories Ltd.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,600,720, Cl. 514-340.000.
Smith, Pat: *See*—
Bell, Charles D.; and Smith, Pat, 4,600,175, Cl. 248-122.000.
Smith, Richard A. G., to Beecham Group P.L.C. Novel enzyme derivatives. 4,600,580, Cl. 424-94.000.
Smith, Roderick A.: *See*—
Chaplin, George B. B.; and Smith, Roderick A., 4,600,863, Cl. 318-114.000.
Smith, Terry L. Tandem seat for ultra light aircraft. 4,600,170, Cl. 244-122.00R.
SmithKline Beckman Corporation: *See*—
Gaitanopoulos, Dimitri; and Weinstock, Joseph, 4,600,714, Cl. 514-213.000.
Snyder, Philip K., to United States of America, National Aeronautics and Space Administration. Spinning disk calibration method and apparatus for laser Doppler velocimeter. 4,600,301, Cl. 356-28.500.
Societa' Cavi Pirelli, S.p.A.: *See*—
Beretta, Germano, 4,600,806, Cl. 174-121.00A.
Societe a Responsabilite Limitee Datome: *See*—
Meuret, Paul V., 4,599,976, Cl. 123-18.00A.
Societe B.B.M. S.A.: *See*—
Bo, Ermano, 4,599,942, Cl. 101-18.000.
Societe Chimique des Charbonnages S.A.: *See*—
Laumain, Francois-Bernard, 4,600,730, Cl. 521-167.000.
Societe Cortial, S.A.: *See*—
Creuzet, Marie-Helene; Feniou, Claude; Guichard, Francoise; Prat, Gisele; Mosser, Jacqueline; and Pontagnier, Henri, 4,600,788, Cl. 549-403.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Castel, Yvon, 4,600,339, Cl. 405-211.000.
Societe Paris-Rhone: *See*—
Mazzorana, Alfred B.; and Froment, Francis, 4,600,850, Cl. 310-242.000.
Sodastream Limited: *See*—
Brown, Eric D., 4,599,886, Cl. 72-349.000.
Soderholm, Rolf, to Kraftelektronik AB. Arrangement in transformers. 4,600,877, Cl. 323-324.000.
Solar Turbines Incorporated: *See*—
Metcalfe, Arthur G.; Napier, James C.; and Compton, William A., 4,600,414, Cl. 55-290.000.
Solheim, John A. Throat structure for golf club bags. 4,600,100, Cl. 206-315.600.
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., to Warner-Lambert Company. Permanently bonded antithrombogenic polyurethane surface. 4,600,652, Cl. 428-423.300.
Solomons, Clive C. Process and kit for determining blood platelet stress. 4,600,696, Cl. 436-63.000.
Soma, Takao: *See*—
Matsui, Minoru; and Soma, Takao, 4,600,038, Cl. 138-140.000.
Someya, Shinzo: *See*—
Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.
Sommer Co.: *See*—
Sommer, Gordon M., 4,600,368, Cl. 417-378.000.
Sommer, Gordon M., to Sommer Co. Pressure actuated downhole pump. 4,600,368, Cl. 417-378.000.
Sony Corporation: *See*—
Kawakubo, Osamu; Munemoto, Eiji; and Okubora, Akihiko, 4,600,397, Cl. 445-6.000.
Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, 4,600,941, Cl. 358-121.000.
Soroczak, Myra M.: *See*—
Mair, Alexander D.; and Soroczak, Myra M., 4,600,505, Cl. 209-9.000.
Sota, Kaoru: *See*—
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, 4,600,540, Cl. 558-255.000.
Sound Attenuators Limited: *See*—
Chaplin, George B. B.; and Smith, Roderick A., 4,600,863, Cl. 318-114.000.
Soussloff, Dimitri G., to Fenner America Inc. Mounting device without axial motion. 4,600,334, Cl. 403-369.000.
Southern Research Institute: *See*—
Temple, Carroll G.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,600,716, Cl. 514-249.000.
Southwest Research Institute: *See*—
Wood, Charles D., III; and Benson, Harvey S., 4,600,052, Cl. 165-165.000.
Sovonics Solar Systems: *See*—
Guha, Subhendu; and Kulman, James, 4,600,801, Cl. 136-249.000.
Spademan, Richard G. Ski boot locating apparatus. 4,600,214, Cl. 280-624.000.
Spahn, Dieter: *See*—
Bachmann, Wolfgang; Spahn, Dieter; and Nuss, Lothar, 4,599,881, Cl. 72-128.000.
Spain, Raymond G.; and Massie, James E., to Hitco. Method and resin solution for splicing carbonized polyacrylonitrile material. 4,600,457, Cl. 156-158.000.
Span Instruments, Inc.: *See*—
Gray, Tommy L., 4,599,902, Cl. 73-705.000.
Spang, Walter G.: *See*—
Kelly, Robert G.; and Spang, Walter G., 4,600,468, Cl. 156-440.000.
Spectra-Physics, Inc.: *See*—
Cain, Gary L.; Honey, Elvin K.; and Goren, Sidney B., 4,600,997, Cl. 364-505.000.
Sperry Corporation: *See*—
Lea, John D., 4,601,025, Cl. 367-125.000.
Scheuneman, James H.; and Michaelson, Wayne A., 4,600,986, Cl. 364-200.000.
Tarbuck, Robert R., 4,600,228, Cl. 294-64.100.
Sphere Investments Limited: *See*—
Van Zyl, Ian D.; and Wolf, Peter, 4,600,105, Cl. 209-587.000.
Spicer, Lyndon R., to Standard Telephones and Cables Public Limited Co. Cable for telecommunications purposes and a method of manufacturing the same. 4,600,268, Cl. 350-96.230.
Spiegelman, Phillip P.: *See*—
Aufdermarsh, Carl A.; Harder, Robert J.; and Spiegelman, Phillip P., 4,600,651, Cl. 428-422.000.
Spindler, Gotthard K.: *See*—
Califano, Herbert T.; Schuchardt, James M.; and Spindler, Gotthard K., 4,600,166, Cl. 244-3.160.
Spinks Industries, Inc.: *See*—
Selecman, Charles E., 4,600,168, Cl. 244-50.000.
Spitz, Werner U. System for deodorizing and decontaminating autopsy rooms. 4,600,557, Cl. 422-4.000.
Spong, Fred W.; Muchnik, Boris J.; and Kalk, Franklin D., to Storage Technology Corporation. Optical storage structure. 4,600,682, Cl. 430-270.000.
Sprague Electric Company: *See*—
Love, Gordon R.; and Millard, Richard J., 4,599,788, Cl. 29-570.000.
Spurr, William F.: *See*—
White, Kenneth W.; and Spurr, William F., 4,600,449, Cl. 148-407.000.
Sridhar, Thirumalai, to Texas Instruments Incorporated. Method and apparatus for testing very large scale integrated memory circuits. 4,601,034, Cl. 371-25.000.
Srinivasagopalan, Rangarajan: *See*—
Kromer, Philip F., III; Srinivasagopalan, Rangarajan; and Fernandez, Raul F., 4,601,044, Cl. 375-17.000.
Stacy, Alan D.: *See*—
Kleimeyer, David L.; Fletcher, Larry N.; Stacy, Alan D.; and Smillie, Allan M., 4,600,434, Cl. 75-58.000.
Stadler, Robert L.: *See*—
Falk, Leonard P.; and Stadler, Robert L., 4,600,121, Cl. 221-130.000.
Stadlmeier, Hans: *See*—
Schonberger, Franz; Stadlmeier, Hans; Brunner, Reinhold; and Wagner, Wolfgang, 4,600,991, Cl. 364-200.000.
Stahl, Helmut. Polishing disk. 4,599,761, Cl. 15-230.120.
Standard Manufacturing Company, Inc.: *See*—
Oswald, Norman D.; Franklin, Carl M.; Gutzler, Marc H.; and Mankey, Harry S., 4,600,069, Cl. 180-24.020.
Standard Microsystems Corporation: *See*—
Richman, Paul, 4,600,933, Cl. 357-23.120.
Standard Oil Company (Indiana): *See*—
Cole, Bill W., 4,600,617, Cl. 428-64.000.
Standard Telephone & Cables: *See*—
Scott, Michael G., 4,600,422, Cl. 65-3.300.
Standard Telephones and Cables Public Limited Co.: *See*—
Spicer, Lyndon R., 4,600,268, Cl. 350-96.230.
State of Israel, Atomic Energy Commission, The: *See*—
Kafri, Oded; and Livnat, Aminadav, 4,600,304, Cl. 356-138.000.
Statnick, Robert M.: *See*—
Yoon, Heeyoung; and Statnick, Robert M., 4,600,568, Cl. 423-242.000.
Stauffer Chemical Company: *See*—
Pallos, Ferenc M., 4,600,431, Cl. 71-92.000.
Steelcase Canada Ltd.: *See*—
Whalen, Robert T., 4,600,254, Cl. 312-323.000.
Steele, James. Layout device for word processors. 4,599,798, Cl. 33-1.00B.
Steering Control Systems, Inc.: *See*—
Stewart, Denzil S.; Bland, Alfred J.; and Rogers, Donald D., 4,600,205, Cl. 280-95.00R.
Steffan, Guido: *See*—
Lindner, Otto; Pelster, Heinrich; Steffan, Guido; and Stuwe, Arnd, 4,600,542, Cl. 260-505.00C.
Steffen, Werner: *See*—
Gorsch, Rainer; Grafe, Wolf-Rainer; Grundmann, Hans-Jorg; Poerschke, Peter; Steffen, Werner; Braunschweig, Thomas; Mark, Rolf-Peter; and Beck, Bernard, 4,600,283, Cl. 354-66.000.
Steinman, Donald K.; and Jacobson, Larry A., to Schlumberger Technology Corporation. Methods and apparatus for measuring thermal neutron decay characteristics of earth formations. 4,600,838, Cl. 250-270.000.
Stelte, David J.: *See*—
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.
Stelter, Norbert; Wuest, Rainer; op de Beeck, Peter; and Bofginer, Gerd, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Control system for a motor vehicle drive unit. 4,599,918, Cl. 74-866.000.
Stenner, Gustav H. Feed rate control for peristaltic pump. 4,600,366, Cl. 417-319.000.
Stepanenko, Alexandr V.; Isaevich, Leonid A.; and Moisinovich, Ljudmila I., to Belorussky Politekhnichesky Institut. Method of making metal fibers and apparatus for effecting same. 4,599,880, Cl. 72-94.000.
Stephen, John F.; Smith, Jerry H.; and Meshreki, Makram H., to ICI Americas Inc. Hindered dydroxybenzyl hexaalkyldiphenyl-methanes and stabilized compositions. 4,600,740, Cl. 524-120.000.
Stepniak, Frank M.; and Kominiak, Andrew A., to Amerace Corporation. Electrical connector. 4,600,260, Cl. 339-111.000.
Stern, Garland, to New York Institute of Technology. Three dimensional animation. 4,600,919, Cl. 340-725.000.
Stevens, Erik; and Van Hoeyveld, Ernestina M., to Tetra Consultants, Inc. Therapeutic treatment. 4,600,582, Cl. 424-91.000.
Stevens, Erik; and Van Hoeyveld, Ernestina M., to Tetra Consultants Inc. Pharmaceutical compositions. 4,600,583, Cl. 424-91.000.
Stewart, Denzil S.; Bland, Alfred J.; and Rogers, Donald D., to Steering Control Systems, Inc. Steering apparatus for motor vehicles. 4,600,205, Cl. 280-95.00R.
Stewart, Robert E., to Litton Systems, Inc. High accuracy accelerometer. 4,599,896, Cl. 73-382.00R.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Lenhard-Backhaus, Hugo, 4,600,068, Cl. 180-6.440.
Stiers, Joseph D., to Multiple-Housing Drapery Services, Inc. Method and apparatus for making pleated draperies of arbitrary lengths. 4,599,958, Cl. 112-262.100.
Stiles, Robert G. Pliable container opening and emptying device. 4,599,758, Cl. 7-158.000.
Stokes, Bruce G.: *See*—
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,600,404, Cl. 604-387.000.
Stomber, Richard J.: *See*—
Galuschak, George; and Stomber, Richard J., 4,599,803, Cl. 33-301.000.

Stone, Erwin R.: *See—*
Litwin, Robert G.; Stone, Erwin R.; and Mitra, Asset K., 4,600,612, Cl. 428-23.000.

Stone, Harris E. Cold drawing a disk into a cap for a paper core. 4,599,885, Cl. 72-347.000.

Stone, Ronald K. Cleaning tool. 4,600,153, Cl. 239-543.000.

Stone, William J., to United States of America, Energy. Precision zero-home locator. 4,600,834, Cl. 250-231.0SE.

Stoner, Claudia C. Eyelid shield and method of making same. 4,599,746, Cl. 2-15.000.

Stoner, Eugene M., to Ares, Inc. Breech/receiver assembly for automatic cannon. 4,599,933, Cl. 89-9.000.

Storage Technology Corporation: *See—*
Spong, Fred W.; Muchnik, Boris J.; and Kalk, Franklin D., 4,600,682, Cl. 430-270.000.

Storp, Siegfried: *See—*
Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, 4,600,632, Cl. 428-220.000.

Stotler, David V.; and Coffey, Fred S., to Owens-Corning Fiberglas Corporation. Method and apparatus for producing a continuous glass filament mat. 4,600,423, Cl. 65-4.400.

Stout, Richard W., to Du Pont de Nemours, E. I., and Company. Metal oxide stabilized chromatography packings. 4,600,646, Cl. 428-405.000.

Strachan, J. Scott, to Medex, Inc. Piezoelectric apparatus for measuring bodily fluid pressure within a conduit. 4,600,855, Cl. 310-338.000.

Strada Cantonale: *See—*
Bianco, Carlo, 4,600,361, Cl. 415-146.000.

Strauss, Jurgen: *See—*
Bergthaller, Peter; Strauss, Jurgen; Runzheimer, Hans-Volker; and Wolfrum, Gerhard, 4,600,681, Cl. 430-242.000.

Streeter, James M.: *See—*
Bangerter, Blauer L.; and Streeter, James M., 4,600,188, Cl. 272-96.000.

Strobel, Charles W.: *See—*
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,599,807, Cl. 34-9.000.

Stroomberg, Anita: *See—*
Cameron, David G.; Hudson, Harry R.; Lagerlund, Inger; Pianka, Max; and Stroomberg, Anita, 4,600,429, Cl. 71-86.000.

Stuhler, Herbert: *See—*
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Stutts, Kenneth J., to Dow Chemical Company, The. Electrosynthesis of six-membered heterocyclic alcohols. 4,600,478, Cl. 204-59.00R.

Stuwe, Arnd: *See—*
Lindner, Otto; Pelster, Heinrich; Steffan, Guido; and Stuwe, Arnd, 4,600,542, Cl. 260-505.00C.

Sugasawa, Fukashi: *See—*
Kuroki, Junsuke; and Sugasawa, Fukashi, 4,600,215, Cl. 280-707.000.

Sugden, Kenneth B., to Sundstrand Corporation. Centrifugal deaerator and pump. 4,600,413, Cl. 55-207.000.

Sugerman, Gerald; and Monte, Salvatore J., to Kenrich Petrochemicals, Inc. Neoalkoxy organo-titanate useful as coupling and polymer processing agents. 4,600,789, Cl. 556-17.000.

Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Differential amplifier with improved dynamic range. 4,600,893, Cl. 330-252.000.

Sugimura, Nobuyuki. Pulsation absorbing device incorporating an inner cylinder provided with slidable valve shoes. 4,600,035, Cl. 138-30.000.

Sugita, Yutaka: *See—*
Imura, Ryo; Sugita, Yutaka; and Kumasaka, Noriyuki, 4,600,488, Cl. 204-192.00N.
Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, 4,601,013, Cl. 365-36.000.

Sugitani, Hiroshi, to Canon Kabushiki Kaisha. Method of preserving ink jet recording head. 4,600,927, Cl. 346-1.100.

Sugiura, Masahiro; Fukushima, Yoshiaki; Hayashi, Hiroaki; Horii, Mitsumasa; Kurimoto, Takako; and Fukumoto, Kazuhiro, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Inorganic material, a process for producing same and a solidifying method thereof. 4,600,437, Cl. 106-74.000.

Sugiura, Noboru, to Hitachi, Ltd. Knock control apparatus for internal combustion engines. 4,599,982, Cl. 123-425.000.

Sugiyama, Yoshiki: *See—*
Yamasaki, Shinji; Sugiyama, Yoshiki; Tangiku, Itsurou; and Iida, Yasumasa, 4,600,086, Cl. 187-27.000.

Suh, Nam P.: *See—*
Alei, Philip E.; and Suh, Nam P., 4,600,631, Cl. 428-212.000.

Suhar, Craig. Lamp with integral heat sink. 4,600,857, Cl. 313-35.000.

Sulzer Brothers Limited: *See—*
Rees, Karl, 4,599,974, Cl. 122-235.00P.

Suman, Michael J.; Van Order, Kim L.; Clark, Russell L.; and Haan, Ted W., to Prince Corporation. Headrest control. 4,600,240, Cl. 297-408.000.

Sumitomo Electric Industries, Ltd.: *See—*
Sasatani, Yukihiro, 4,599,787, Cl. 29-569.00L.

Sumitomo Metal Industries, Ltd.: *See—*
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, 4,600,047, Cl. 164-453.000.

Sunds Defibrator Aktiebolag: *See—*
Reinhall, Rolf B.; and Johansson, Johan G. I., 4,600,475, Cl. 162-261.000.

Sundstrand Corporation: *See—*
Blain, Edward S., 4,600,369, Cl. 418-55.000.
Miller, E. K., 4,600,318, Cl. 384-130.000.
Sugden, Kenneth B., 4,600,413, Cl. 55-207.000.
Sutrina, Thomas A.; and Bland, Timothy J., 4,600,848, Cl. 310-54.000.

Sundstrand Data Control, Inc.: *See—*
White, Kenneth W.; and Spurr, William F., 4,600,449, Cl. 148-407.000.

Sura, Christopher B.: *See—*
Schwartz, Marc D.; and Sura, Christopher B., 4,600,989, Cl. 364-200.000.

Sutenbach, Paul M.; Peek, Brian R.; and Daubert, Richard F., to Illinois Tool Works Inc. Push-on plastic wing-nut fastener. 4,600,344, Cl. 411-435.000.

Sutkowski, Robert J.: *See—*
Bridges, Jack E.; Sutkowski, Robert J.; and Hofer, Kenneth E., Jr., 4,600,356, Cl. 414-694.000.

Sutrina, Thomas A.; and Bland, Timothy J., to Sundstrand Corporation. Cooling of dynamoelectric machines. 4,600,848, Cl. 310-54.000.

Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, to Canon Kabushiki Kaisha. Image forming apparatus with detector and control. 4,600,294, Cl. 355-14.00D.

Suzuki, Koji, to Canon Kabushiki Kaisha. Image forming apparatus. 4,600,295, Cl. 355-14.00D.

Suzuki, Nobuaki: *See—*
Yamamoto, Shizuo; Kanda, Tetsuo; Suzuki, Nobuaki; and Matsuda, Hiroyuki, 4,600,076, Cl. 181-233.000.

Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, to Hitachi, Ltd. Magnetic bubble memory device. 4,601,013, Cl. 365-36.000.

Suzuki, Ryoichi, to Canon Kabushiki Kaisha. Camera provided with a device for generating a signal representative of the finished state of the exposure. 4,600,288, Cl. 354-435.000.

Suzuki, Susumu: *See—*
Kudo, Yukinori; and Suzuki, Susumu, 4,600,937, Cl. 358-21.00R.

Suzuki, Takashi: *See—*
Moroo, Akira; Tokunaga, Yoshiyasu; Suzuki, Takashi; and Yoshioka, Tadahiko, 4,600,313, Cl. 366-313.000.

Svengren, Anders G.; and Ganrot, Bertil A., to Nestec S.A. Preparation of a rolled pastry product. 4,600,595, Cl. 426-501.000.

Svenska AB Ivers Lee: *See—*
Lundstrom, Rene , 4,599,849, Cl. 53-427.000.

Swaby, Harold: *See—*
Reynold, Timothy; Montgomery, Robert W.; Swaby, Harold; and Garner, Henry C., 4,601,042, Cl. 373-93.000.

Swanson, Harold V., to GHA Lock Joint, Inc. Concrete pipe machine. 4,600,373, Cl. 425-144.000.

Sweet, Steven R.: *See—*
Lobsinger, James R.; Sweet, Steven R.; and Natter, Eckard F., 4,600,924, Cl. 343-17.10R.

Swerczek, Thomas W., to University of Kentucky Research Foundation, The. Composition for topical and infusion treatment of wounds and burns. 4,600,711, Cl. 514-23.000.

Swisher, Horton E., to Cal-Flo Corporation. Method for removing skins from avocados. 4,600,593, Cl. 426-438.000.

Sybron Corporation: *See—*
Olsen, Robert A., 4,600,384, Cl. 433-29.000.

Sykes, Richard B.; and Tymiak, Adrienne, to E. R. Squibb & Sons, Inc. Antibiotic obafluroin. 4,600,786, Cl. 549-263.000.

Syntex (U.S.A.) Inc.: *See—*
Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., 4,600,785, Cl. 549-212.000.

Synthes AG: *See—*
Klaue, Kaj, 4,599,999, Cl. 128-92.0EB.

Szczepanski, Henry, to Ciba-Geigy Corporation. N-(cyclopropylpyrimidinyl-N'-(aryl-sulfonyl) ureas having herbicidal activity. 4,600,428, Cl. 71-76.000.

Sze, Robert C., to University of California, The Regents of the. Inductively stabilized, long pulse duration transverse discharge apparatus. 4,601,039, Cl. 372-83.000.

Szekely, Tamas: *See—*
Libor, Oszkar; Nagy, Gabor; and Szekely, Tamas, 4,600,744, Cl. 524-446.000.

Szelenyi, Istvan: *See—*
Morsdorf, Peter; Schickaneder, Helmut; Engler, Heidrun; Szelenyi, Istvan; Ahrens, Kurt H.; and Brune, Kay, 4,600,721, Cl. 514-367.000.

Szymanski, Chester D.: *See—*
Gleason, Patricia A.; and Szymanski, Chester D., 4,600,515, Cl. 252-8.50A.

Tabacchi, Vittorio. Frame for eyeglasses with interchangeable nose rest members. 4,600,279, Cl. 351-137.000.

Tabler, Charles P., to Buckhorn Material Handling Group, Inc.; and Ekco Products, Inc. Symmetrical bakery basket. 4,600,103, Cl. 206-505.000.

Tabuchi, Jyoichi: *See—*
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,600,633, Cl. 428-220.000.

Tacke, Peter: *See—*
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, 4,600,753, Cl. 525-439.000.

Taisho Pharmaceutical Co., Ltd.: *See—*
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, 4,600,540, Cl. 558-255.000.

Takagi, Kaneyuki; Kawai, Yoichi; and Kamiya, Yoshiyasu, to Daiwa Company Limited; and Mitsui Toatsu Chemicals Inc. Polyolefin composition. 4,600,748, Cl. 525-133.000.
Takagiwa, Hiroyuki: *See*—
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki, 4,600,676, Cl. 430-106.600.
Takahashi, Isoji: *See*—
Ohtsuka, Shuichi; Yoda, Akira; Kimura, Akinori; and Takahashi, Isoji, 4,600,291, Cl. 355-3.00R.
Takahashi, Kazuo: *See*—
Ohashi, Keizi; and Takahashi, Kazuo, 4,600,733, Cl. 523-144.000.
Takahashi, Kazuyoshi: *See*—
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.
Takahashi, Naoki, to Casio Computer Co., Ltd. Electronic musical instrument with touch response function. 4,599,930, Cl. 84-1.100.
Takahashi, Shunji: *See*—
Miyano, Takashi; and Takahashi, Shunji, 4,599,981, Cl. 123-361.000.
Takamoto, Tsutomu: *See*—
Matoba, Yoshiyuki; Misaka, Yoshisuke; Ohhashi, Yasutake; Takamoto, Tsutomu; and Hirata, Yutaka, 4,600,047, Cl. 164-453.000.
Takara Shuzo Co., Ltd.: *See*—
Matsui, Susumu; Yoshihama, Yoshio; and Taniguchi, Tsutomu, 4,600,689, Cl. 435-25.000.
Takeda Chemical Industries, Ltd.: *See*—
Arita, Kazuhiro; Masuda, Isao; and Sano, Yasuo, 4,600,766, Cl. 528-207.000.
Takeda Riken Kogyo Kabushikikaisha: *See*—
Hayashi, Mishio, 4,600,994, Cl. 364-484.000.
Takeda, Shiro: *See*—
Kitakohji, Toshisuke; Takeda, Shiro; Nakajima, Minoru; and Tokunaga, Hiroshi, 4,600,685, Cl. 430-313.000.
Takeichi, Hideo: *See*—
Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, 4,600,627, Cl. 428-203.000.
Takemae, Yoshihiro: *See*—
Mochizuki, Hirohiko; Takemae, Yoshihiro; Nakano, Tomio; and Sato, Kimiaki, 4,601,017, Cl. 365-189.000.
Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, 4,601,013, Cl. 365-36.000.
Takeuchi, Teruaki: *See*—
Suzuki, Ryo; Sugita, Yutaka; Kodama, Naoki; Takeshita, Masatoshi; and Takeuchi, Teruaki, 4,601,013, Cl. 365-36.000.
Takeuchi, Yukinobu: *See*—
Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, 4,600,851, Cl. 310-324.000.
Taki, Hisao; and Iida, Takeo, to N K B Co., Ltd. Process for fabricating display panel. 4,600,460, Cl. 156-235.000.
Takimoto, Masataka: *See*—
Fujimaki, Yoshihide; Takimoto, Masataka; and Nomori, Hiroyuki, 4,600,292, Cl. 355-3.0SC.
Tamaki, Kiyoshi: *See*—
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki, 4,600,676, Cl. 430-106.600.
Tamura, Kazuyoshi, to Aisin Seiki Kabushikikaisha. Process of coating the surface of a board. 4,600,601, Cl. 427-96.000.
Tanabe, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Sampling pulse generator. 4,600,943, Cl. 358-147.000.
Tanaka, Atsuo: *See*—
Dohnomoto, Tadashi; and Tanaka, Atsuo, 4,600,661, Cl. 428-614.000.
Tanaka, Haruhiko: *See*—
Kongoh, Takeshi; and Tanaka, Haruhiko, 4,599,962, Cl. 112-454.000.
Tanaka, Saburo: *See*—
Mizutani, Akihiko; Murayama, Hiroyoshi; Arakawa, Kohsaku; and Tanaka, Saburo, 4,600,513, Cl. 210-712.000.
Tanaka, Shun-ichiro, to Kabushiki Kaisha Toshiba. Method of testing ceramic article. 4,601,050, Cl. 378-18.000.
Tandemloc, Inc.: *See*—
DiMartino, John M., Sr., 4,599,829, Cl. 52-79.700.
Tangiku, Itsurou: *See*—
Yamasaki, Shinji; Sugiyama, Yoshiki; Tangiku, Itsurou; and Iida, Yasumasa, 4,600,086, Cl. 187-27.000.
Taniguchi, Tsutomu: *See*—
Matsui, Susumu; Yoshihama, Yoshio; and Taniguchi, Tsutomu, 4,600,689, Cl. 435-25.000.
Tanuma, Itsuo: *See*—
Honda, Toshio; Tanuma, Itsuo; Takeichi, Hideo; Oturu, Hiromi; and Morimura, Yasuhiro, 4,600,627, Cl. 428-203.000.
Tarbuck, Robert R., to Sperry Corporation. Lockable compliant end effector apparatus. 4,600,228, Cl. 294-64.100.
Tatsumi, Kaoru; Kishida, Takao; Marui, Kuniyoshi; and Ishii, Takaaki, to Kabushiki Kaisha Toshiba. Telephone systems. 4,600,809, Cl. 179-2.0EA.
Tavs, Peter: *See*—
Broecker, Franz J.; Tavs, Peter; Laas, Harald; and Aders, Wolf-Karlo, 4,600,799, Cl. 568-772.000.
Taylor, David L.: *See*—
Haggard, Eugene E.; Correa, John A.; Keene, Terrell M.; Calhoun, Wiley C.; Flemming, Edgar J.; Taylor, David L.; Hartley, Richard N.; Martinez, Francisco J.; and Lopez, Rudy A., 4,599,776, Cl. 29-213.00R.
Taylor, Wilson E., Jr.; and Hand, Larry E., to Peavey Electronics Corporation. Digital audio amplifier having a high power output level and low distortion. 4,600,891, Cl. 330-10.000.
TDK Corporation: *See*—
Hosaka, Akihiko; Okuyama, Kiyotaka; and Kanazawa, Kiyoto, 4,600,650, Cl. 428-413.000.
Teel, Toby: *See*—
Miller, Jim; Humphries, Jim; and Teel, Toby, 4,600,054, Cl. 166-75.100.
Tektronix, Inc.: *See*—
Dubarko, Donald L., 4,600,255, Cl. 312-333.000.
Grellman, H. Erwin; Laakso, Carl W.; Reagan, John J.; and Roland, Leonard A., 4,600,907, Cl. 333-246.000.
Paul, Byron G.; Maynard, James H.; and Dalrymple, John C., 4,601,021, Cl. 364-521.000.
Telease, Inc.: *See*—
Field, Robert W.; Perr, Clarence D.; and Gerlach, Ronald R., 4,600,942, Cl. 358-122.000.
Teledyne Industries, Inc.: *See*—
Hufton, Arthur; and Gardner, David, 4,599,888, Cl. 73-19.000.
Telfer, G. Ronald. Black hole fire irons. 4,599,989, Cl. 126-164.000.
Teller, Werner; Koebernick, Wolfgang; Haaf, Arthur; Naab, Paul; and Preiss, Michael, to Bayer Aktiengesellschaft. Process for the preparation of 1,4-dihydropyridinedicarboxylic esters. 4,600,778, Cl. 546-249.000.
Temco, Inc.: *See*—
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,599,891, Cl. 73-38.000.
Temer, Vladan. Gain control compensation for bandpass filter with variable bandwidth. 4,600,903, Cl. 333-177.000.
Temme, Helmut; and Wrobbel, Karl-Heinz, to Gewerkschaft Eisenhutte Westfalia; and Hammerwerke Haspe Gebruder Kettler. Scraper units for mine conveyor scraper-chain assemblies. 4,600,097, Cl. 198-731.000.
Temple, Carroll G.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., to Southern Research Institute. 1,2-dihydropyrido[3,4-b]pyrazines. 4,600,716, Cl. 514-249.000.
Tendulkar, Gautan; Becker, Claus; and Richter, Wolfgang, to Siemens Aktiengesellschaft. Memory-programmable control. 4,600,988, Cl. 364-200.000.
Teng, Chuan C., to 501 Dailey Petroleum Services Corporation. Shock absorbing drilling tool. 4,600,062, Cl. 175-322.000.
Tennessee Valley Authority: *See*—
Mair, Alexander D.; and Soroczak, Myra M., 4,600,505, Cl. 209-9.000.
Tennison, Stephen R.: *See*—
McCarroll, John J.; Tennison, Stephen R.; and Wilkinson, Nicholas P., 4,600,571, Cl. 423-363.000.
Teplan, Istvan: *See*—
Seprodi, Janos; Teplan, Istvan; Mezo, Imre; and Erchegyi, Judit, 4,600,705, Cl. 514-15.000.
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki. Toner composition containing titanate coupling agent for electrophotography and method for producing said toner. 4,600,676, Cl. 430-106.600.
Teramoto, Kazuyoshi: See—
Kogawa, Takashi; Teramoto, Kazuyoshi; and Hashimoto, Takeshi, 4,601,009, Cl. 364-900.000.
Terasawa, Koji, to Canon Kabushiki Kaisha. Ink jet recording apparatus. 4,600,931, Cl. 346-140.00R.
Terauchi, Kiyoshi; Kubo, Yasuhiro; and Hiraga, Masaharu, to Sanden Corporation. Refrigerant compressor for automobile air-conditioning system. 4,600,367, Cl. 417-360.000.
Terumo Kabushiki Kaisha: *See*—
Shimizu, Atsushi; and Ohtsubo, Sadami, 4,600,507, Cl. 210-94.000.
Yoshida, Takao, 4,600,613, Cl. 428-35.000.
Tetra Consultants, Inc.: *See*—
Stevens, Erik; and Van Hoeyveld, Ernestina M., 4,600,582, Cl. 424-91.000.
Stevens, Erik; and Van Hoeyveld, Ernestina M., 4,600,583, Cl. 424-91.000.
Texaco Inc.: *See*—
Virk, Kashmir S.; Caggiano, Michael A.; and Leisenring, Roger L., Jr., 4,600,562, Cl. 422-180.000.
Texas Eastern Drilling Systems, Inc.: *See*—
Hatten, James L., 4,600,037, Cl. 138-120.000.
Texas Industries, Inc.: *See*—
Harris, Philip H., 4,600,438, Cl. 106-100.000.
Texas Instruments Incorporated: *See*—
Barboza, Joseph V., 4,600,161, Cl. 242-55.000.
Kim, Bumman; and Saunier, Paul, 4,599,790, Cl. 29-571.000.
Shah, Ashwin H.; Gallia, James D.; Wang, I-Fay; and Mahant-Shetti, Shivaling S., 4,601,019, Cl. 365-200.000.
Sridhar, Thirumalai, 4,601,034, Cl. 371-25.000.
Trenkler, George; Delagi, Richard; Britton, Charles; and Schwensfeir, Robert J., Jr., 4,599,771, Cl. 29-155.00R.
Ty, Henry; and White, Alfred J., 4,600,164, Cl. 242-107.600.
TFK Company, Inc.: *See*—
Korenowski, Theodore F., 4,600,474, Cl. 159-47.300.
Theodoropulos, Spyros. Isomaleimide and isophthalamide derivatives of chromophors. 4,600,775, Cl. 544-99.000.
Theriault, George E. Smoke detector cutoff timer. 4,600,314, Cl. 368-10.000.

Thermo Electron Corporation: *See—*
Fritzsche, Donald E.; Panora, Robert A.; and Bangert, Matthew D., 4,599,990, Cl. 126-351.000.
Thermodynetics Inc.: *See—*
Sievers, Richard W., 4,599,773, Cl. 29-157.30R.
Thésing, Richard A.: *See—*
Houck, Willie G.; Newsome, Reginald W.; Nichols, Walter A.; and Thesing, Richard A., 4,600,027, Cl. 131-336.000.
Thibault, Eric. Construction tool. 4,599,779, Cl. 29-283.000.
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Bouchard, Andre C.; Thibault, Paul A.; and Marcucci, Rudolph V., 4,600,856, Cl. 313-25.000.
Thimineur, Raymond J.: *See—*
Traver, Frank J.; Thimineur, Raymond J.; and Zotto, Anthony A., 4,600,436, Cl. 106-3.000.
Thiokol Corporation: *See—*
Junior, Kenneth E.; Byrd, James D.; and Hightower, James O., Jr., 4,600,732, Cl. 523-138.000.
Thoma, Martin; and Bunger, Paul, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Method for protecting paired metal force-transmitting machine elements against fretting corrosion. 4,600,479, Cl. 204-14.100.
Thomas, John. Shoe buffing machine. 4,599,760, Cl. 15-31.000.
Thomas, William L., to Zenith Radio Corporation. Full-field teletext system with dynamic addressability. 4,600,921, Cl. 340-825.310.
Thompson, James E.: *See—*
Nieman, Gerald R.; Thompson, James E.; Couper, William D.; and Clyatt, Clarence L., III, 4,600,262, Cl. 339-147.00R.
Thompson, Larry B.: *See—*
Berthold, John W., III; Jeffers, Larry A.; and Thompson, Larry B., 4,600,836, Cl. 250-231.00P.
Thomson CSF: *See—*
Boyer, Claude; Gauthier, Francois H.; and Gerbe, Jean-Pierre, 4,600,271, Cl. 350-174.000.
Fay, Bernard, 4,600,309, Cl. 356-401.000.
Thoroughbred Plastics Corp.: *See—*
Roof, William M.; and Blair, Dennis P., 4,600,131, Cl. 222-478.000.
Thurner, Gary H., to Bolens Corporation. Modular tiller hitch for a lawn and garden tractor. 4,600,070, Cl. 180-53.700.
Tibor, Ertavi: *See—*
von Hein, Eduard; and Tibor, Ertavi, 4,600,186, Cl. 271-182.000.
TII Corporation: *See—*
Wortman, Donald W., 4,600,875, Cl. 323-303.000.
Till, Samuel B., Jr. Boiler tube stabbing apparatus. 4,599,774, Cl. 29-157.400.
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Timor, Andres. Diskette holder. 4,600,110, Cl. 211-120.000.
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Aycock, David F.; and Ting, Sai-Pei, 4,600,741, Cl. 524-139.000.
Tinti, Maria O., to Sigma Tau Industrie Farmaceutiche Riunite S.P.A. Process for preparing gamma-dimethylamino L-beta hydroxy butyric acid. 4,600,794, Cl. 562-567.000.
Titus, Robert D.: *See—*
Huser, Diane L.; Schaus, John M.; Titus, Robert D.; and Weigel, Leland O., 4,600,777, Cl. 546-164.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,600,633, Cl. 428-220.000.
Toder, Ellis I. Hinged ceiling track. 4,599,763, Cl. 16-94.00D.
Tokunaga, Hiroshi: *See—*
Kitakohji, Toshisuke; Takeda, Shiro; Nakajima, Minoru; and Tokunaga, Hiroshi, 4,600,685, Cl. 430-313.000.
Tokunaga, Yoshiyasu: *See—*
Moroo, Akira; Tokunaga, Yoshiyasu; Suzuki, Takashi; and Yoshioka, Tadahiko, 4,600,313, Cl. 366-313.000.
Tokuno, Masateru; and Mori, Yasuharu, to Rengo Co., Ltd. Apparatus for detecting marks on a running web. 4,600,841, Cl. 250-548.000.
Tokutomi, Seijiro; Shindo, Osamu; and Yuda, Hideaki, to Asahi Kogaku Kogyo K.K. Focus detecting device. 4,600,830, Cl. 250-201.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Sato, Hironobu, 4,600,864, Cl. 318-254.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Kinoshita, Tsuneo, 4,600,995, Cl. 364-491.000.
Kizu, Shuji; Ishida, Tsuyoshi; Hiramatsu, Kenichi; and Miura, Junji, 4,600,843, Cl. 250-578.000.
Kudo, Yukinori; and Suzuki, Susumu, 4,600,937, Cl. 358-21.00R.
Masuda, Eiji; Matsuo, Kenji; and Fujita, Yasuhiko, 4,600,916, Cl. 340-347.0AD.
Seki, Nagataka; Koike, Shunichi; and Watanabe, Yukio, 4,600,917, Cl. 340-645.000.
Tanabe, Toshiyuki, 4,600,943, Cl. 358-147.000.
Watanabe, Junji, 4,600,293, Cl. 355-8.000.
Yoneyama, Tsuneo; and Izawa, Koji, 4,601,003, Cl. 364-518.000.
Tom Oker Sales & Mfg., Inc.: *See—*
Oker, Thomas W., 4,599,928, Cl. 83-581.100.
Tomalia, Donald A.; and Wilson, Larry R., to Dow Chemical Company, The. Cyclic peptides. 4,600,535, Cl. 260-239.30R.
Tominaga, Hiroshi, to Fuji Electric Co., Ltd. Bead fluidizing type body supporting device. 4,599,755, Cl. 5-453.000.
Tomisawa, Kazuyuki; Kameo, Kazuya; Matsunaga, Toru; Saito, Shiuji; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Benzoylpropionic acid derivatives. 4,600,540, Cl. 558-255.000.
Tompkins, Bruce E.: *See—*
Khoury, Henri A.; and Tompkins, Bruce E., 4,600,936, Cl. 357-79.000.
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Toray Industries, Inc.: *See—*
Hiramatsu, Tohru; Matsuhisa, Yohji; and Higuchi, Tomitake, 4,600,572, Cl. 423-447.200.
Torisaka, Yasunori; Ohuchi, Kiyoyuki; and Nakazawa, Yoshinori, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for tempering and working high strength low ductile alloy. 4,600,446, Cl. 148-2.000.
Tornabene, Michael G.: *See—*
La Stella, Joseph P.; and Tornabene, Michael G., 4,599,858, Cl. 60-497.000.
Torok, Ernest J.: *See—*
Hedin, Raymond C.; Meddaugh, Samuel A.; and Torok, Ernest J., 4,600,270, Cl. 350-162.170.
Toshiba Kikai Kabushiki Kaisha: *See—*
Araki, Hideo; and Matsunaga, Chiharu, 4,599,856, Cl. 60-421.000.
Eto, Katsuo, 4,600,818, Cl. 200-5.00R.
Kawauchi, Yasunobu, 4,600,996, Cl. 364-491.000.
Toth, Tibor, to Hoechst Aktiengesellschaft. Immunological latex agglutination in presence of certain lactones or lactams. 4,600,698, Cl. 436-534.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, Fumikazu; and Ohguchi, Masakatsu, 4,600,743, Cl. 524-377.000.
Toyo Seikan Kaisha Ltd.: *See—*
Hara, Akio, 4,600,884, Cl. 324-236.000.
Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, 4,600,648, Cl. 428-412.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Akahira, Rokuro; Someya, Shinzo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,600,432, Cl. 71-94.000.
Toyoda, Hiroyasu: *See—*
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Toyoda, Minoru: *See—*
Saito, Hiroshi; Nagai, Kiyotaka; Mori, Daisuke; Hatanaka, Masahiko; Shibuya, Hideo; Abe, Tomoaki; and Toyoda, Minoru, 4,601,052, Cl. 381-51.000.
Toyokawa, Akira: *See—*
Fujita, Sadao; Toyokawa, Akira; Mutoh, Shinichiro; Shimomukai, Eishu; and Ueda, Kenji, 4,600,378, Cl. 432-8.000.
Toyomoto, Kazuo: *See—*
Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, 4,600,749, Cl. 525-314.000.
Toyoshima, Masakatsu: *See—*
Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, 4,600,941, Cl. 358-121.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Asai, Akio; Ando, Yukito; and Kirii, Kazunari, 4,599,887, Cl. 72-453.130.
Dohnomoto, Tadashi; and Tanaka, Atsuo, 4,600,661, Cl. 428-614.000.
Traiteur, Rene : *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.
Tran, Hoc N.: *See—*
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Traver, Frank J.; Thimineur, Raymond J.; and Zotto, Anthony A., to General Electric Company. Durable silicone emulsion polish. 4,600,436, Cl. 106-3.000.
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Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,600,724, Cl. 514-510.000.
Trenkler, George; Delagi, Richard; Britton, Charles; and Schwensfeir, Robert J., Jr., to Texas Instruments Incorporated. Method of making a stiffened composite metal panel. 4,599,771, Cl. 29-155.00R.
Tribe, Leonard T.: *See—*
Bruder, John R.; Sivulka, Gerald M.; and Tribe, Leonard T., 4,600,820, Cl. 200-84.00C.
Truglio, Ralph. Vehicle access control device. 4,600,335, Cl. 404-6.000.
TRW Inc.: *See—*
Glynn, John R.; and Cobb, Lloyd A., 4,600,805, Cl. 174-102.00R.
Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for registering elevator call. 4,600,087, Cl. 187-29.00R.
Tsuji, Shuji; Ito, Hiroshi; and Saka, Kazuhiko, to Omron Tateisi Electronics Co. Pattern analyzer. 4,601,057, Cl. 382-51.000.
Tubi Italia S.p.A.: *See—*
Ceccacci, Pier B., 4,599,783, Cl. 29-450.000.
Tucker, Joseph R., III: *See—*
Gaither, Paul I.; and Tucker, Joseph R., III, 4,599,921, Cl. 82-1.00C.
Tufano, Albert L.: *See—*
Canu, Anthony, Jr.; Hoube, Allen G.; Knight, Kenneth F.; Tufano, Albert L.; and Porzio, Anthony J., 4,599,784, Cl. 29-450.000.
Tupper, Leland C.; Walker, Loren H.; Weiss, Herbert W.; and Sember, James W., to General Electric Company. Excitation current control for induction motor drive using load commutated inverter circuit. 4,600,874, Cl. 318-798.000.

Tutelman, David M.: *See*—
Marzec, Richard P.; Schramm, George W.; Sharp, John B.; Stelte, David J.; and Tutelman, David M., 4,601,035, Cl. 371-32.000.
Tveten, Alan B.: *See*—
Koo, Kee P.; Dandridge, Anthony; Tveten, Alan B.; and Sigel, George H., Jr., 4,600,885, Cl. 324-244.000.
Twyford, Robert H., to Mechanical Enterprises, Inc. Switch assembly. 4,600,819, Cl. 200-16.00A.
Ty, Henry; and White, Alfred J., to Texas Instruments Incorporated. Safety seat belt system and latch release mechanism used therein. 4,600,164, Cl. 242-107.600.
Tyler, Walter: *See*—
Cunniff, William B.; and Tyler, Walter, 4,600,814, Cl. 179-18.0BC.
Tymiak, Adrienne: *See*—
Sykes, Richard B.; and Tymiak, Adrienne, 4,600,786, Cl. 549-263.000.
Tzifkansky, Guy; and Marchais, Jean-Claude, to CIDELCEM. Food container. 4,600,117, Cl. 220-366.000.
Uchida, Naoshi; and Kandatsu, Kiyoshi, to Fuji Electric Company Ltd. Circuit breaker. 4,600,908, Cl. 335-8.000.
Uchida, Seiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Preparation of printing plate by pattern exposing both sides of curable liquid resin. 4,600,667, Cl. 430-22.000.
Ueberschaar, Maria. Hairpieces. 4,600,029, Cl. 132-53.000.
Ueda, Kenji: *See*—
Fujita, Sadao; Toyokawa, Akira; Mutoh, Shinichiro; Shimomukai, Eishu; and Ueda, Kenji, 4,600,378, Cl. 432-8.000.
Uhl, Klaus: *See*—
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Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, to A. Nattermann & Cie GmbH. 3-amino-1-(4,5,6,7-tetrahydro-benzothiazolyl)-2-pyrazolines and a process for the treatment of inflammatory or allergic processes in humans. 4,600,722, Cl. 514-367.000.
Uhtenwoldt, Herbert R., to Cincinnati Milacron Inc. Grinding machine with apparatus for changing grinding wheel tools and workpieces. 4,599,786, Cl. 29-568.000.
Ungemach, Steven R., to Ricoh Co., Ltd.; and Ricoh Systems, Inc. Magnetic brush/stationary electrode development system. 4,600,290, Cl. 355-3.0DD.
UniDynamics Corporation: *See*—
Falk, Leonard P.; and Stadler, Robert L., 4,600,121, Cl. 221-130.000.
Union Carbide Corporation: *See*—
Robeson, Lloyd M.; and Osborn, Claiborn L., 4,600,647, Cl. 428-412.000.
Union Oil Company of California: *See*—
Jessup, Peter J.; Brass, Stephen G.; and Croudace, Michael C., 4,600,408, Cl. 44-70.000.
Ward, John W.; and Carlson, Timothy L., 4,600,497, Cl. 208-89.000.
Ward, John W., 4,600,498, Cl. 208-111.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Andrews, Anthony J.; Errey, Keith H.; Kearsley, Andrew J.; and Webb, Colin E., 4,601,040, Cl. 372-57.000.
Hutley, Michael C., 4,600,831, Cl. 250-201.000.
Kilvington, John, 4,601,005, Cl. 364-602.000.
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Administrator Environmental Protection Agency: *See*—
Hiatt, Michael H., 4,600,559, Cl. 422-89.000.
Administrator, National Aeronautics and Space Administration: *See*—
Chutjian, Ara N., 4,600,840, Cl. 250-338.000.
Agriculture: *See*—
Aldrich, Jeffrey R., 4,600,581, Cl. 424-84.000.
Wolff, Ivan A., 4,600,781, Cl. 548-201.000.
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Hedin, Raymond C.; Meddaugh, Samuel A.; and Torok, Ernest J., 4,600,270, Cl. 350-162.170.
Army: *See*—
Allan, Barry D.; and Mitchell, Porter H., 4,600,453, Cl. 149-36.000.
Everett, Seth L., Jr., 4,600,319, Cl. 400-54.000.
Fredricksen, Hans P., 4,600,905, Cl. 333-196.000.
Goodwin, Eugene L., 4,599,827, Cl. 51-326.000.
Hunter, Joe S., 4,599,897, Cl. 73-432.00R.
Priddy, Randolph W., 4,600,305, Cl. 356-152.000.
Robbins, Frederick M.; Allen, Alfred L.; Walker, John E.; and Cohen, Samuel H., 4,600,589, Cl. 426-56.000.
Rosenthal, Richard L., 4,601,002, Cl. 364-518.000.
Commerce: *See*—
Kent, Ernest W., 4,601,055, Cl. 382-49.000.
Energy: *See*—
Krause, Lawrence J., 4,600,656, Cl. 428-446.000.
Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., 4,600,448, Cl. 148-407.000.
Stone, William J., 4,600,834, Cl. 250-231.0SE.
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Abshire, James B., 4,600,299, Cl. 356-5.000.
Kumar, Devendra; Fohlen, George M.; and Parker, John A., 4,600,769, Cl. 528-322.000.
Snyder, Philip K., 4,600,301, Cl. 356-28.500.
Navy: *See*—
Chafin, Andrew P.; and Nielsen, Arnold T., 4,600,536, Cl. 260-349.000.
Doherty, Robert J.; and Allan, Joseph J., 4,600,455, Cl. 156-64.000.
Koo, Kee P.; Dandridge, Anthony; Tveten, Alan B.; and Sigel, George H., Jr., 4,600,885, Cl. 324-244.000.
Whitlock, Robert R.; and Papanicolaou, Nicolas A., 4,600,853, Cl. 310-313.00B.
U.S. Peroxygen Company: *See*—
Pastorino, Ronald L., 4,600,727, Cl. 521-82.000.
U. S. Philips Corporation: *See*—
Damen, Johannes P. M.; Prijs, Klaas; Witmer, Cornelis H. M.; and de With, Gijsbertus, 4,600,957, Cl. 360-120.000.
Einhaus, Hermanus F., 4,600,247, Cl. 312-8.000.
Guiglini, Jean-Yves M., 4,601,001, Cl. 364-518.000.
Horvat, Philippe, 4,600,890, Cl. 329-122.000.
Meyer, Joseph; and Vinton, David J., 4,600,686, Cl. 430-326.000.
United Steel & Wire Company: *See*—
Badger, Ronald L., 4,600,204, Cl. 280-33.99A.
United Technologies Corporation: *See*—
Lamm, Foster P.; and Pike, Roscoe A., 4,600,738, Cl. 523-500.000.
Martin, Anthony N., 4,600,870, Cl. 318-610.000.
Veltri, Richard D.; and Galasso, Francis S., 4,600,182, Cl. 266-286.000.
Zemek, Thomas G., 4,600,359, Cl. 414-754.000.
University of Aberdeen, The University Court of The: *See*—
Watmough, David J., 4,600,011, Cl. 128-664.000.
University of California: *See*—
Hirschfeld, Tomas B., 4,599,901, Cl. 73-705.000.
Santos, Joseph T.; and Meyer, Robert G., 4,600,898, Cl. 331-116.0FE.
Sze, Robert C., 4,601,039, Cl. 372-83.000.
University of Florida: *See*—
Ihas, Gary G.; and Berg, Robert F., 4,600,802, Cl. 174-15.0CA.
University of Iowa Research Foundation: *See*—
Walder, Joseph A., 4,600,531, Cl. 530-385.000.
University of Kentucky Research Foundation, The: *See*—
Swerczek, Thomas W., 4,600,711, Cl. 514-23.000.
Upjohn Company, The: *See*—
Walker, Jerry A., 4,600,538, Cl. 260-397.450.
Urban, Arthur L.: *See*—
Barnard, Michael A.; Urban, Arthur L.; Kester, Bruce J.; Beugelsdyk, Anthony F.; and Kester, Dale C., 4,599,912, Cl. 74-501.00R.
Urquhart, Gordon T.: *See*—
Urquhart, Thomas N.; and Urquhart, Gordon T., 4,600,491, Cl. 204-300.0EC.
Urquhart, Thomas N.; and Urquhart, Gordon T. Workpiece drying apparatus. 4,600,491, Cl. 204-300.0EC.
Urso, Charles L. Combined steam generator and engine. 4,599,859, Cl. 60-514.000.
Ushiyama, Shigeyuki: *See*—
Ishida, Hiroshi; and Ushiyama, Shigeyuki, 4,600,835, Cl. 250-231.0SE.
USM Corporation: *See*—
Price, Frank C.; and White, Anthony M., 4,599,759, Cl. 12-1.00A.
UTM Power Products, Inc.: *See*—
Counsel, Eugene F., 4,600,264, Cl. 339-247.000.
Uya, Masaru; and Kaneko, Katsuyuki, to Matsushita Electric Industrial Co., Ltd. Full adder. 4,601,007, Cl. 364-784.000.
VAC-TEC Systems, Inc.: *See*—
Lefkow, Anthony R. T., 4,600,489, Cl. 204-192.00R.
Valentine, Donald H.: *See*—
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,600,793, Cl. 560-25.000.
Valeo: *See*—
Billet, Rene ; and Bacher, Michel, 4,600,092, Cl. 192-70.110.
Vallak, Hannes, to International Ferrox Co., Establishment. Process for thermal insulation of the surface of a molten mass of steel and thermally insulating board used as a cover plate for carrying out said process. 4,600,560, Cl. 422-41.000.
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, to De Onderneming en S.B.B.M.; and N.V. Atlas Copco Airpower Corp. Mud removal process and apparatus. 4,600,338, Cl. 405-74.000.
Vanderlaan, Robert D., to Pneumo Corporation. Limited angle torque motor with high torque output multiple coils and increased magnetic centering torque. 4,600,910, Cl. 335-229.000.
Vanderlinde, William: *See*—
Dyroff, David R.; Burke, Edward J.; Vanderlinde, William; and Backes, Thomas W., 4,600,750, Cl. 525-398.000.
van Dijk, Cornelis: *See*—
de Jongh, Rudolph O.; and van Dijk, Cornelis, 4,600,701, Cl. 502-159.000.
Van Hoeyveld, Ernestina M.: *See*—
Stevens, Erik; and Van Hoeyveld, Ernestina M., 4,600,582, Cl. 424-91.000.
Stevens, Erik; and Van Hoeyveld, Ernestina M., 4,600,583, Cl. 424-91.000.
Van Horn, Albert R.: *See*—
Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., 4,600,785, Cl. 549-212.000.
Van Order, Kim L.: *See*—
Suman, Michael J.; Van Order, Kim L.; Clark, Russell L.; and Haan, Ted W., 4,600,240, Cl. 297-408.000.

VanRens, Russell J.: *See—*
Bailey, Frank V.; Larsen, Robert T.; and VanRens, Russell J., 4,600,046, Cl. 164-34.000.

Van Wormer, Richard A.; Baugh, John L.; Ledet, Charles; and Roach, Malcolm, to Hughes Tool Company. Equipment insert and method. 4,600,058, Cl. 166-382.000.

Van Zyl, Ian D.; and Wolf, Peter, to Sphere Investments Limited. Method and apparatus for sorting objects of ore by monitoring reflected radiation. 4,600,105, Cl. 209-587.000.

Varga-Papp, Andre, to Ceeco Machinery Manufacturing Limited. Method and apparatus for manufacturing compact conductors with bunchers. 4,599,853, Cl. 57-9.000.

VDO Adolf Schindling AG: *See—*
Collonia, Harald, 4,599,980, Cl. 123-339.000.

Veltri, Richard D.; and Galasso, Francis S., to United Technologies Corporation. High density, sintered silicon nitride containing articles and methods for using the same to process molten nickel. 4,600,182, Cl. 266-286.000.

Vepa Aktiengesellschaft: *See—*
Fleissner, Gerold, 4,599,939, Cl. 100-2.000.

Verhoeven, John D.: *See—*
Schmidt, Frederick A.; Verhoeven, John D.; and Gibson, Edwin D., 4,600,448, Cl. 148-407.000.

Vermot-Gaud, Jacques; and Joyeux, Didier, to Battelle Memorial Institute. Needle matrix printer. 4,600,322, Cl. 400-124.000.

Verner, Bo: *See—*
Van Bruwaene, Albert; Neyrinck, Luc; Maertens, Luc; Verner, Bo; and Fors, Staffan, 4,600,338, Cl. 405-74.000.

Versa Corporation: *See—*
Adams, Arthur R., 4,600,093, Cl. 193-35.00A.

Vertino, Antonina: *See—*
Hoovler, Thomas H.; and Vertino, Antonina, 4,600,320, Cl. 400-122.000.

Villano, Ralph R.: *See—*
Georgalas, Nick; Pucknat, John G.; and Villano, Ralph R., 4,600,737, Cl. 523-414.000.

Vinen Corp.: *See—*
Nenna, Vito, 4,600,548, Cl. 264-71.000.

Vinton, David J.: *See—*
Meyer, Joseph; and Vinton, David J., 4,600,686, Cl. 430-326.000.

Virk, Kashmir S.; Caggiano, Michael A.; and Leisenring, Roger L., Jr., to Texaco Inc. Method and apparatus for filtering engine exhaust gas. 4,600,562, Cl. 422-180.000.

Vista International Packaging, Inc.: *See—*
Knepshield, Thomas R., 4,599,764, Cl. 17-41.000.

Vitcenda, Marie A.; and Zmolek, Alfred J., to Merrick's, Inc. Feeding regimen for minimizing weaning stress. 4,600,585, Cl. 426-2.000.

Vock, Manfred H.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; Vock, Manfred H.; Miller, Kevin P.; and Luccarelli, Domenick, Jr., 4,600,576, Cl. 424-49.000.

Vogel, Ralph A.; and Caudill, Keith E., to Essex Group, Inc. Method and apparatus for determining the elongation property of copper wire. 4,599,905, Cl. 73-830.000.

Voges, Alan: *See—*
Voges, Alan M., Jr.; and Voges, Gregory L., 4,599,819, Cl. 43-3.000.

Voges, Alan M., Jr.; and Voges, Gregory L., to Voges, Greg; and Voges, Alan. Decoy dabbler. 4,599,819, Cl. 43-3.000.

Voges, Greg: *See—*
Voges, Alan M., Jr.; and Voges, Gregory L., 4,599,819, Cl. 43-3.000.

Voges, Gregory L.: *See—*
Voges, Alan M., Jr.; and Voges, Gregory L., 4,599,819, Cl. 43-3.000.

Vogt, Adolf, to Karl Mengele & Sohne. Apparatus for transporting and positioning sheet metal plates. 4,600,349, Cl. 414-225.000.

Von Roll AG.: *See—*
Andreoli, Bruno, 4,599,951, Cl. 110-171.000.

von Bonin, Wulf; and Matenar, Gerd, to Bayer Aktiengesellschaft. Rubber mixtures and mouldings produced therefrom by vulcanization. 4,600,734, Cl. 523-179.000.

von Hein, Eduard; and Tibor, Ertavi, to Maschinenfabrik Wifag. Method and apparatus for reducing the impact speed of a printed product which is delivered to a fly pocket of a fly delivery wheel in a rotary printing press. 4,600,186, Cl. 271-182.000.

von Wedel, Karl. Grate plates retaining solids and improving gas distribution to be used in grates for the heat treatment of solid material. 4,600,380, Cl. 432-58.000.

Voss, James R.: *See—*
Parent, Christopher A.; and Voss, James R., 4,600,083, Cl. 187-7.000.

Vostermans, A. G.; and Vostermans, H. L., to A.G. Vostermans B.V. Impeller for axial fan with blade locking means. 4,600,362, Cl. 416-208.000.

Vostermans, H. L.: *See—*
Vostermans, A. G.; and Vostermans, H. L., 4,600,362, Cl. 416-208.000.

W. L. Gore & Associates: *See—*
Sacre, Guillaume, 4,599,810, Cl. 36-55.000.

W. R. Grace & Co.: *See—*
Browne, Alan R.; and Morgan, Charles R., 4,600,679, Cl. 430-162.000.
Cuisia, Dionisio G.; and Hwa, Chih M., 4,600,524, Cl. 252-181.000.
Wiercinski, Robert A.; and Whicher, Stephen J., 4,600,635, Cl. 428-220.000.

WABCO Fahrzeugbremsen GmbH: *See—*
Feldmann, Joachim; and Isernhagen, Fritz, 4,600,090, Cl. 188-218.0XL.

Wacker-Chemie GmbH: *See—*
Eck, Herbert; Menzel, Hartmut; Jira, Reinhard; and Prasse, Alfred, 4,600,790, Cl. 556-421.000.
Louis, Eckhart; Hechtl, Wolfgang; and Hefner, Heinz, 4,600,731, Cl. 523-109.000.
Wegehaupt, Karl-Heinrich; Pusch, Rudolf; and Pfeffer, Hans R., 4,600,657, Cl. 428-447.000.

Wada, Tsuneo: *See—*
Terada, Sadatugu; Tamaki, Kiyoshi; Murata, Hideki; Matsubara, Akitoshi; Wada, Tsuneo; and Takagiwa, Hiroyuki, 4,600,676, Cl. 430-106.600.

Wade, Richard J. Portable tree seat for hunters and outdoorsmen. 4,600,081, Cl. 182-187.000.

Wagner, David P.: *See—*
Broomfield, Donald J.; Briggs, Paul C.; Parker, Eric G.; and Wagner, David P., 4,600,662, Cl. 428-624.000.

Wagner, Gene A.; and Newberg, Irwin L., to Hughes Aircraft Company. RF amplifier with frequency spectrum control. 4,600,892, Cl. 330-144.000.

Wagner, Wolfgang, to Wagner, Wolfgang. Suction injector II. 4,600,403, Cl. 604-115.000.

Wagner, Wolfgang: *See—*
Schonberger, Franz; Stadlmeier, Hans; Brunner, Reinhold; and Wagner, Wolfgang, 4,600,991, Cl. 364-200.000.

Waite, Thomas R., to Rockwell International Corporation. Phase-matching arrayed telescopes with a corner-cube-bridge metering rod. 4,600,308, Cl. 356-363.000.

Wakatsuki Kikai Kabushiki Kaisha: *See—*
Wakatsuki, Masakatsu, 4,600,149, Cl. 239-120.000.

Wakatsuki, Masakatsu, to Wakatsuki Kikai Kabushiki Kaisha. Apparatus for producing ultrahigh pressure water jet. 4,600,149, Cl. 239-120.000.

Waku, Toshihiko: *See—*
Sakamoto, Akira; Waku, Toshihiko; Fukami, Takeshi; Toyoshima, Masakatsu; and Komatsubara, Michimasa, 4,600,941, Cl. 358-121.000.

Walder, Joseph A., to University of Iowa Research Foundation. Production of alpha-alpha cross-linked hemoglobins in high yield. 4,600,531, Cl. 530-385.000.

Waldo, Tim R. Photograph display wheel. 4,599,815, Cl. 40-377.000.

Walker, Christopher P. H.; and Wilson, Peter J., to Inmos Limited. Repairable ROM array. 4,601,031, Cl. 371-10.000.

Walker, Jerry A., to Upjohn Company, The. Corticosteroids from 17-keto steroids via 20-cyano-$\Delta^{17(20)}$-pregnanes. 4,600,538, Cl. 260-397.450.

Walker, John E.: *See—*
Robbins, Frederick M.; Allen, Alfred L.; Walker, John E.; and Cohen, Samuel H., 4,600,589, Cl. 426-56.000.

Walker, Loren H.: *See—*
Tupper, Leland C.; Walker, Loren H.; Weiss, Herbert W.; and Sember, James W., 4,600,874, Cl. 318-798.000.

Walker Magnetics Group, Inc.: *See—*
Ela, Roger B.; and Guerin, Paul H., 4,600,964, Cl. 361-144.000.

Waller, A. J., Jr. Interlocking wooden mat. 4,600,336, Cl. 404-35.000.

Walling, James D.: *See—*
Ng, Yee S.; Contois, Lawrence E.; Mitchell, John D.; and Walling, James D., 4,600,669, Cl. 430-47.000.

Wallsten, Hans I., to Inventing S.A. Method of applying a wear-resistant coating on a thin, metallic strip-shaped carrier material. 4,600,599, Cl. 427-34.000.

Walsh, Gerald M.: *See—*
Liang, Chi-Dean; and Walsh, Gerald M., 4,600,710, Cl. 514-357.000.

Walsh, James W. Apparatus for directing attention to specific locations such as emergency exits. 4,600,914, Cl. 340-286.00R.

Walton, Charles A. Electronic proximity identification and recognition system with isolated two-way coupling. 4,600,829, Cl. 235-439.000.

Wang, I-Fay: *See—*
Shah, Ashwin H.; Gallia, James D.; Wang, I-Fay; and Mahant-Shetti, Shivaling S., 4,601,019, Cl. 365-200.000.

Wang, Ke-Chin; Rushe, Eugene T.; and Winkelbauer, Howard M., to Dresser Industries, Inc. Bonding a sialon coating to a substrate. 4,600,607, Cl. 427-421.000.

Ward, John W.; and Carlson, Timothy L., to Union Oil Company of California. Process for treating waxy shale oils. 4,600,497, Cl. 208-89.000.

Ward, John W., to Union Oil Company of California. Mild hydrocracking with a zeolite catalyst containing silica-alumina. 4,600,498, Cl. 208-111.000.

Ward, Richard: *See—*
Scully, John P.; and Ward, Richard, 4,600,879, Cl. 324-58.50A.

Ward, Richard E. Livestock tank water heater. 4,599,973, Cl. 119-73.000.

Warner-Lambert Company: *See—*
Ghebre-Sellassie, Isaac; Gordon, Robert H.; Harris, Michael R.; and Nesbitt, Russell U., Jr., 4,600,645, Cl. 428-403.000.
Patt, William, 4,600,707, Cl. 514-46.000.
Solomon, Donald D.; McGary, Charles W.; and Pascarella, Vincent J., 4,600,652, Cl. 428-423.300.

Warren, David R.: *See—*
Eggleston, Joe E.; and Warren, David R., 4,600,059, Cl. 166-385.000.

Washita, Hiroshi; and Oguro, Kaoru, to Asahi Glass Company Ltd. Laminated safety glass. 4,600,653, Cl. 428-425.600.

Wasner, Gunter: *See*—
Dost, Willibald; Habenschaden, Kurt; Kreutzer, Hans; and Wasner, Gunter, 4,600,272, Cl. 350-287.000.

Watanabe Engineering Kabushikigaisha: *See*—
Watanabe, Mamoru, 4,600,245, Cl. 303-115.000.

Watanabe, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Photocopying apparatus and method wherein the optical scanner acts as an alignment guide. 4,600,293, Cl. 355-8.000.

Watanabe, Mamoru, to Watanabe Engineering Kabushikigaisha. Liquid pressure control device for anti-lock brake system. 4,600,245, Cl. 303-115.000.

Watanabe, Masaki; Yagasaki, Akio; and Kawashima, Yoshinori, to Honda Giken Kogyo Kabushiki Kaisha. All wheel drive vehicle. 4,600,074, Cl. 180-251.000.

Watanabe, Yukio: *See*—
Seki, Nagataka; Koike, Shunichi; and Watanabe, Yukio, 4,600,917, Cl. 340-645.000.

Watari, Masao; and Chiba, Seibi, to Nippon Electric Co., Ltd. Pattern distance calculating equipment. 4,601,054, Cl. 382-1.000.

Water Research Centre: *See*—
Butwell, Anthony J., 4,600,510, Cl. 210-273.000.

Waterman Industries: *See*—
Appling, Donald F., 4,600,222, Cl. 285-158.000.

Watkins, Joseph J.: *See*—
Jackson, Winston J., Jr.; and Watkins, Joseph J., 4,600,768, Cl. 528-308.000.

Watmough, David J., to University of Aberdeen, The University Court of The. Tele-diaphanography apparatus. 4,600,011, Cl. 128-664.000.

Watt, William R., to James River/Dixie-Northern, Inc. Incorporation of a hydrophile in fibrous webs to enhance absorbency. 4,600,462, Cl. 156-278.000.

Wean United, Inc.: *See*—
Ginzburg, Vladimir B.; and Guo, Remn M., 4,599,883, Cl. 72-234.000.

Weather Ready Inc.: *See*—
Sanders, Ronald J., 4,600,665, Cl. 429-120.000.

Webb, Colin E.: *See*—
Andrews, Anthony J.; Errey, Keith H.; Kearsley, Andrew J.; and Webb, Colin E., 4,601,040, Cl. 372-57.000.

Webb, Shirley B.: *See*—
Haken, Pieter T.; and Webb, Shirley B., 4,600,712, Cl. 514-188.000.

Weber, Georg: *See*—
Eidenschink, Rudolf; and Weber, Georg, 4,600,528, Cl. 252-299.610.

Weber, Robert E.: *See*—
Sheldon, Donald A.; Stokes, Bruce G.; Weber, Robert E.; and Greenman, Edwin G., 4,600,404, Cl. 604-387.000.

Wedertz, Larry D.: *See*—
Ross, Oakley G.; Kline, Mark L.; and Wedertz, Larry D., 4,600,218, Cl. 285-50.000.

Wegehaupt, Karl-Heinrich; Pusch, Rudolf; and Pfeffer, Hans R., to Wacker-Chemie GmbH. Protective coatings for asphaltic concrete surfaces and methods for forming the same. 4,600,657, Cl. 428-447.000.

Wegener Communications, Inc.: *See*—
Lafferty, Stephen H., 4,600,902, Cl. 333-14.000.

Wehrman, James L., to Modine Manufacturing. Tank-header plate connection. 4,600,051, Cl. 165-149.000.

Weigand, John C.: *See*—
Chamberlain, William; and Weigand, John C., 4,600,947, Cl. 358-165.000.

Weigel, Leland O.: *See*—
Huser, Diane L.; Schaus, John M.; Titus, Robert D.; and Weigel, Leland O., 4,600,777, Cl. 546-164.000.

Weinstock, Joseph: *See*—
Gaitanopoulos, Dimitri; and Weinstock, Joseph, 4,600,714, Cl. 514-213.000.

Weise, Lutz: *See*—
Belart, Juan; Burgdorf, Jochen; Kircher, Dieter; and Weise, Lutz, 4,600,243, Cl. 303-92.000.

Weiss, Heinz; and Gelb, Herbert, to Deere & Company. Driver station for a vehicle. 4,600,236, Cl. 296-190.000.

Weiss, Herbert W.: *See*—
Tupper, Leland C.; Walker, Loren H.; Weiss, Herbert W.; and Sember, James W., 4,600,874, Cl. 318-798.000.

Weiss, Hermann: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Weissman, Bernard, to IPCO Corporation. Contoured dental post. 4,600,392, Cl. 433-225.000.

Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., to DeSoto, Inc. Process for drying polymeric beads and associating shading pigments therewith. 4,599,807, Cl. 34-9.000.

Wenzl, Helmut: *See*—
Klatt, Karl-Heinz; Wenzl, Helmut; and Meuffels, Paul, 4,600,660, Cl. 428-607.000.

Werner, Klemens: *See*—
Schaeffler, Arthur; and Werner, Klemens, 4,600,202, Cl. 277-53.000.

West, Steven J.: *See*—
Bromberg, Edward E. A.; Diggens, Albert; West, Steven J.; and Ross, James W., 4,600,494, Cl. 204-401.000.

Wester, Norbert; Uhl, Klaus; Gulden, Walter; and Schneider, Gerhart, to Hoechst Aktiengesellschaft. Sulfonated tributylphenol ethoxylates, their use, and a process for preparing sulfonated alkoxylates. 4,600,516, Cl. 252-8.55R.

Westinghouse Electric Corp.: *See*—
Bishop, Martin T., 4,600,961, Cl. 361-76.000.
Caputo, William R., 4,600,865, Cl. 318-274.000.
Goldberg, Newton N.; and Hudock, John S., 4,600,441, Cl. 106-253.000.
Katz, Leonard R.; and Desmarchais, Walter E., 4,600,553, Cl. 376-292.000.

Westvaco Corporation: *See*—
Knapp, David H.; and Lafler, Robert E., 4,600,629, Cl. 428-201.000.

Wetor, Clyde R.: *See*—
Heidner, Richard C.; Wetor, Clyde R.; and Fiedler, Bruce H., 4,600,075, Cl. 180-336.000.

Wetzig, Helmut: *See*—
Uhlendorf, Joachim; Borbe, Harald O.; Leyck, Sigurd; Parnham, Michael J.; and Wetzig, Helmut, 4,600,722, Cl. 514-367.000.

Whalen, Robert T., to Steelcase Canada Ltd. Sliding door having pinion and idler wheel. 4,600,254, Cl. 312-323.000.

Wheeler, Douglas J.: *See*—
Sane, Ajit Y.; Wheeler, Douglas J.; Gagescu, Dan; Debely, Pierre E.; Adorian, Iudita L.; and Derivaz, Jean-Pierre, 4,600,481, Cl. 204-67.000.

Wheeler, Glynn P.: *See*—
Temple, Carroll G.; Montgomery, John A.; Elliott, Robert D.; and Wheeler, Glynn P., 4,600,716, Cl. 514-249.000.

Whelan, Michael, to Siemens Corporate Research & Suppport, Inc. Circuit testing apparatus employing signature analysis. 4,601,033, Cl. 371-25.000.

Whicher, Stephen J.: *See*—
Wiercinski, Robert A.; and Whicher, Stephen J., 4,600,635, Cl. 428-220.000.

White, Alfred J.: *See*—
Ty, Henry; and White, Alfred J., 4,600,164, Cl. 242-107.600.

White, Anthony M.: *See*—
Price, Frank C.; and White, Anthony M., 4,599,759, Cl. 12-1.00A.

White Automotive Corporation: *See*—
Frederick, Dennis R.; and Setter, Ronald E., 4,600,235, Cl. 296-106.000.

White Chemical Corporation: *See*—
Mischutin, Vladimir, 4,600,606, Cl. 427-389.000.

White, Kenneth W.; and Spurr, William F., to Sundstrand Data Control, Inc. Titanium alloy (15V-3Cr-3Sn-3Al) for aircraft data recorder. 4,600,449, Cl. 148-407.000.

White, Lawrence K.; and Miszkowski, Nancy A., to RCA Corporation. Method and device for determining the contour of spin-coated thin films of material on substrate topography. 4,600,597, Cl. 427-9.000.

Whitlock, Robert R.; and Papanicolaou, Nicolas A., to United States of America, Navy. Saw-CTD serial to parallel imager and waveform recorder. 4,600,853, Cl. 310-313.00B.

Wiater, Kenneth W.: *See*—
Cardona, Ramon M.; and Wiater, Kenneth W., 4,600,929, Cl. 346-134.000.

Wicker, Gordon R.: *See*—
Hepworth, Malcolm T.; and Wicker, Gordon R., 4,599,955, Cl. 110-347.000.

Wickes Manufacturing Company: *See*—
Bedwell, Thomas J.; and Clarke, Earl J., 4,599,936, Cl. 92-228.000.

Wiegers, Ben W.; Chou, Eddie C. J.; Bruno, John D.; and Leaver, Helen S., to AMAX Inc. Solvent extraction of cobalt (II) from sulfate solutions with cobalt extractants. 4,600,435, Cl. 75-119.000.

Wieland, Dieter: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Wiercinski, Robert A.; and Whicher, Stephen J., to W. R. Grace & Co. Bitumen adhesive and waterproofing membranes containing same. 4,600,635, Cl. 428-220.000.

Wiggins, Eugene T.: *See*—
Horwitz, Lawrence B.; and Wiggins, Eugene T., 4,601,047, Cl. 375-2.200.

Wilhelm, Wilhelm; and Incecik, Zafer, to Siemens Aktiengesellschaft. Integrable semiconductor circuit for a frequency divider. 4,601,049, Cl. 377-115.000.

Wilkerson, John M., III: *See*—
Ruffner, Charles G.; and Wilkerson, John M., III, 4,600,761, Cl. 526-270.000.

Wilkinson, Nicholas P.: *See*—
McCarroll, John J.; Tennison, Stephen R.; and Wilkinson, Nicholas P., 4,600,571, Cl. 423-363.000.

Willach, Rudolf; and Dibowski, Gunter, to Deutsche Babcock Werke Aktiengesellschaft. Bowl mill. 4,600,157, Cl. 241-59.000.

Willard, G. Fred: *See*—
Lee, David M.; Hutchings, David A.; Sieloff, Gloria M.; and Willard, G. Fred, 4,600,765, Cl. 528-193.000.

Willetts, Charles A., to Allied Tube & Conduit Corporation. Module for forming a barrier and method of assembly. 4,600,179, Cl. 256-67.000.

Williams, Brian L., to Marpac Industries, Inc. Dry toner cartridge system and method of filling same. 4,599,851, Cl. 53-471.000.

Williams, Fred E., Jr.: *See*—
Ryder, Francis E.; and Williams, Fred E., Jr., 4,599,968, Cl. 118-305.000.

Williams, Gregory A., to Zenith Electronics Corporation. Low cost synchronizing signal separator. 4,600,944, Cl. 358-154.000.

Williams Patent Crusher and Pulverizer Company: *See*—
Williams, Robert M., 4,599,954, Cl. 110-346.000.

Williams, Robert M., to Williams Patent Crusher and Pulverizer Company. Sewage sludge disposal process and apparatus therefor. 4,599,954, Cl. 110-346.000.

Willson, James R., to AMF Incorporated. Bifurcated contact arm in a miniature relay. 4,600,909, Cl. 335-133.000.

Wilson, Bill. Trailer hydraulic brake system. 4,600,089, Cl. 188-112.00R.

Wilson, Larry R.: *See*—
Tomalia, Donald A.; and Wilson, Larry R., 4,600,535, Cl. 260-239.30R.

Wilson, Peter J.: *See*—
Walker, Christopher P. H.; and Wilson, Peter J., 4,601,031, Cl. 371-10.000.

Wilson, Robert W.: *See*—
Hendrickson, William A.; Evans, Jack L.; Paulson, Kenneth R.; and Wilson, Robert W., 4,600,673, Cl. 430-66.000.

Windham, Bob E., to Windham Manufacturing Company. Security stand. 4,600,250, Cl. 312-208.000.

Windham Manufacturing Company: *See*—
Windham, Bob E., 4,600,250, Cl. 312-208.000.

Wine, Charles M., to RCA Corporation. Automatic digital fine tuning system. 4,601,060, Cl. 455-192.000.

Winkelbauer, Howard M.: *See*—
Wang, Ke-Chin; Rushe, Eugene T.; and Winkelbauer, Howard M., 4,600,607, Cl. 427-421.000.

Winnek, Douglas F. Apparatus and method of projection printing of three-dimensional photographs. 4,600,297, Cl. 355-22.000.

Winner, Peter P., to SCM Corporation. Phosphate epoxy acrylic copolymers. 4,600,754, Cl. 525-531.000.

Winter, David C.; and Long, John D., to Deere & Company. Depth sensing structure for an agricultural implement. 4,600,060, Cl. 172-4.000.

Wirt, Leslie S., to Lockheed Corporation. Sound barrier. 4,600,078, Cl. 181-286.000.

Wirth, Walter, to Hergeth Hollingsworth GmbH. Method and apparatus for forming a more even web from staple fibers. 4,599,766, Cl. 19-106.00R.

Wise, Colin C.: *See*—
Evans, John M.; and Wise, Colin C., 4,600,015, Cl. 128-780.000.

Wiseman, Donald F. Method and apparatus for measuring fluid flow. 4,599,895, Cl. 73-204.000.

Witman, Mark W.: *See*—
Paul, Winfried; Lower, Hartmut; Muller, Peter R.; Witman, Mark W.; and Storp, Siegfried, 4,600,632, Cl. 428-220.000.

Witmer, Cornelis H. M.: *See*—
Damen, Johannes P. M.; Prijs, Klaas; Witmer, Cornelis H. M.; and de With, Gijsbertus, 4,600,957, Cl. 360-120.000.

Wittern, Klaus-Peter: *See*—
Hoppe, Udo; Quack, Jochen M.; Reng, Alwin; Stuhler, Herbert; and Wittern, Klaus-Peter, 4,600,539, Cl. 260-410.700.

Wolf, Gunter: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Wolf, Jurgen: *See*—
Gommel, Reinhard; Laser, Jurgen; Hoppner, Klaus; Meyer, Gerhard; Salomon, Hans G.; Wolf, Gunter; Wieland, Dieter; Weiss, Hermann; and Wolf, Jurgen, 4,600,418, Cl. 55-462.000.

Wolf, Peter: *See*—
Van Zyl, Ian D.; and Wolf, Peter, 4,600,105, Cl. 209-587.000.

Wolff, Ivan A., to United States of America, Agriculture. 2-formyl-2-halomalonates and compound derived therefrom. 4,600,781, Cl. 548-201.000.

Wolfrum, Gerhard: *See*—
Bergthaller, Peter; Strauss, Jurgen; Runzheimer, Hans-Volker; and Wolfrum, Gerhard, 4,600,681, Cl. 430-242.000.

Wong, Man-Chong: *See*—
Joseph, Robert R.; and Wong, Man-Chong, 4,600,624, Cl. 428-161.000.

Wood, Charles D., III; and Benson, Harvey S., to Southwest Research Institute. Compact heat exchanger. 4,600,052, Cl. 165-165.000.

Wood, Louis L.; and Calton, Gary J., to Purification Engineering, Inc. Immobilized cells for preparing phenylalanine. 4,600,692, Cl. 435-108.000.

Wooff, Edward A., Jr.: *See*—
Sluyter, Erik; and Wooff, Edward A., Jr., 4,600,938, Cl. 358-98.000.
Sluyter, Erik; and Wooff, Edward A., Jr., 4,600,939, Cl. 358-98.000.

Wortman, Donald W., to TII Corporation. Power supplies with latch-up prevention and automatic back-up. 4,600,875, Cl. 323-303.000.

Wren, Douglas L.: *See*—
Cooper, Gary F.; Wren, Douglas L.; Van Horn, Albert R.; Li, Tsung-Tee; and Beard, Colin C., 4,600,785, Cl. 549-212.000.

Wright, Danny O.: *See*—
Pauwels, Michael A.; and Wright, Danny O., 4,600,993, Cl. 364-431.050.

Wright, Randall J. Carpenter's square and protractor. 4,599,806, Cl. 33-469.000.

Wrightman, Ronald A. Log joining configuration. 4,599,837, Cl. 52-233.000.

Wrobbel, Karl-Heinz: *See*—
Temme, Helmut; and Wrobbel, Karl-Heinz, 4,600,097, Cl. 198-731.000.

Wuest, Rainer: *See*—
Stelter, Norbert; Wuest, Rainer; op de Beeck, Peter; and Bofginer, Gerd, 4,599,918, Cl. 74-866.000.

Wulff, Claus H.: *See*—
Freitag, Dieter; Wulff, Claus H.; Henes, Gerhard; Bottenbruch, Ludwig; and Tacke, Peter, 4,600,753, Cl. 525-439.000.

Wydeven, Robert M.; and Gehl, Warren, to Donaldson Company, Inc. Filter with integral structural framework. 4,600,420, Cl. 55-501.000.

Wyle Laboratories: *See*—
Cummings, Ralph L.; and Clark, Marshall L., 4,600,695, Cl. 436-2.000.

Wynn, David K.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Gregg, James R.; and Wynn, David K., 4,599,884, Cl. 72-346.000.

Wyrwich, Helmut; Graschew, Georgi; Chatzipetros, Johann; and Feinendegen, Ludwig E., to KFA—Kernforschungsanlage Julich GmbH. Caliper for measuring deformable objects. 4,599,800, Cl. 33-143.00C.

Xerox Corporation: *See*—
Hoffend, Thomas R.; and Mammino, Joseph, 4,600,677, Cl. 430-108.000.

Yagasaki, Akio: *See*—
Watanabe, Masaki; Yagasaki, Akio; and Kawashima, Yoshinori, 4,600,074, Cl. 180-251.000.

Yagi, Isaburo: *See*—
Hyodo, Masakatsu; Kusumoto, Koji; and Yagi, Isaburo, 4,600,615, Cl. 428-36.000.

Yamaguchi, Koretaka: *See*—
Minekawa, Saburo; Yamaguchi, Koretaka; Toyomoto, Kazuo; Fujimoto, Einosuke; Nakayama, Norikatu; and Senoh, Shikazo, 4,600,749, Cl. 525-314.000.

Yamamoto, Makoto: *See*—
Nakamura, Eitaro; Hata, Kotaro; and Yamamoto, Makoto, 4,600,521, Cl. 252-62.540.

Yamamoto, Shizuo; Kanda, Tetsuo; Suzuki, Nobuaki; and Matsuda, Hiroyuki, to Chiyoda Chemical Engineering & Con. Co., Ltd. Device for attenuating pulsation of fluids in piping systems. 4,600,076, Cl. 181-233.000.

Yamamura, Mitsugu; and Yomoda, Minoru, to Canon Kabushiki Kaisha. Alignment apparatus. 4,600,282, Cl. 353-122.000.

Yamano, Shoji; Mikata, Yoshitaka; Higuchi, Tadashi; and Nishide, Kazuhiro, to Yamato Scale Company, Limited. Dispersion feeder. 4,600,096, Cl. 198-505.000.

Yamasaki, Shinji; Sugiyama, Yoshiki; Tangiku, Itsurou; and Iida, Yasumasa, to Mitsubishi Denki Kabushiki Kaisha. Elevator hoist apparatus. 4,600,086, Cl. 187-27.000.

Yamasaki, Tetsuya; Kishimoto, Takashi; and Yamauchi, Ichirou, to Nippon Sheet Glass Co., Ltd. Optical distributor. 4,600,267, Cl. 350-96.150.

Yamashita, Yoshio; and Kawazu, Ryuji, to Oki Electric Industry Co., Ltd. Process for forming a negative resist using high energy beam. 4,600,684, Cl. 430-296.000.

Yamato Scale Company, Limited: *See*—
Yamano, Shoji; Mikata, Yoshitaka; Higuchi, Tadashi; and Nishide, Kazuhiro, 4,600,096, Cl. 198-505.000.

Yamauchi, Ichirou: *See*—
Yamasaki, Tetsuya; Kishimoto, Takashi; and Yamauchi, Ichirou, 4,600,267, Cl. 350-96.150.

Yamazaki, Shunpei. Printing member for electrostatic photocopying. 4,600,670, Cl. 430-57.000.

Yamazaki, Takashi: *See*—
Ooshio, Hirosuke; Aikawa, Tetsuo; Jo, Hidetaka; Okano, Haruo; and Yamazaki, Takashi, 4,600,492, Cl. 204-298.000.

Yan, Man F.: *See*—
Ling, Hung C.; and Yan, Man F., 4,600,967, Cl. 361-321.000.

Yanase, Shozaburo. Bag for mother's milk. 4,600,104, Cl. 206-604.000.

Yashiro Kako Ltd.: *See*—
Fujii, Hideichi; Miyake, Takehito; and Konishi, Hiromu, 4,600,241, Cl. 297-457.000.

Yasuda, Satoshi: *See*—
Nakagome, Hideki; and Yasuda, Satoshi, 4,599,866, Cl. 62-3.000.

Yasuhara, Masahiro: *See*—
Hayashi, Yukichi; Itako, Eiji; and Yasuhara, Masahiro, 4,600,094, Cl. 194-217.000.

Yazaki, Jinichi; Sakano, Kozaburo; and Matsuo, Junichi, to Toyo Seikan Kaisha, Ltd. Hot-melt adhesive as intermediate layer of a laminate structure. 4,600,648, Cl. 428-412.000.

Yoda, Akira: *See*—
Ohtsuka, Shuichi; Yoda, Akira; Kimura, Akinori; and Takahashi, Isoji, 4,600,291, Cl. 355-3.00R.

Yokota, Fumiki: *See*—
Sekine, Yoshitada; and Yokota, Fumiki, 4,600,869, Cl. 318-568.000.

Yokoyama, Issei: *See*—
Hara, Kiyoaki; and Yokoyama, Issei, 4,600,306, Cl. 356-317.000.

Yokoyama, Takashi, to MCC Corporation. Cutting tool. 4,599,795, Cl. 30-188.000.

Yomoda, Minoru: *See*—
Yamamura, Mitsugu; and Yomoda, Minoru, 4,600,282, Cl. 353-122.000.

Yonemoto, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling elevators. 4,600,088, Cl. 187-29.00R.

Yoneyama, Tomio: *See*—
Imazeki, Shuji; Mukoh, Akio; Sato, Mikio; Kaneko, Masaharu; Yoneyama, Tomio; and Iwanami, Junko, 4,600,527, Cl. 252-299.100.

Yoneyama, Tsuneo; and Izawa, Koji, to Tokyo Shibaura Denki Kabushiki Kaisha. Document rearrangement system. 4,601,003, Cl. 364-518.000.
Yoon, Heeyoung; and Statnick, Robert M., to Conoco Inc. Flue gas desulfurization process. 4,600,568, Cl. 423-242.000.
Yoon, Heeyoung, to Conoco Inc. Flue gas desulfurization process. 4,600,569, Cl. 423-243.000.
York, Billie M., Jr., to Alcon Laboratories, Inc. Aldose reductase inhibitors useful in ophthalmic wound healing. 4,600,717, Cl. 514-278.000.
York, Troy F.; and Dearing, Arthur G. Oil dispensing and receiving apparatus. 4,600,042, Cl. 141-98.000.
Yoshida, Fumikazu: *See—*
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, Fumikazu; and Ohguchi, Masakatsu, 4,600,743, Cl. 524-377.000.
Yoshida Kogyo K. K.: *See—*
Kaminaga, Hiromitsu, 4,599,838, Cl. 52-235.000.
Yoshida, Masayuki, to Pioneer Electronic Corporation. Digital-to-analog converter circuit. 4,600,915, Cl. 340-347.0DA.
Yoshida, Takao, to Terumo Kabushiki Kaisha. Medical bag. 4,600,613, Cl. 428-35.000.
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Corrosion-resistant pipe coupling structures. 4,600,219, Cl. 285-55.000.
Yoshihama, Yoshio: *See—*
Matsui, Susumu; Yoshihama, Yoshio; and Taniguchi, Tsutomu, 4,600,689, Cl. 435-25.000.
Yoshihara, Kunio: *See—*
Suzuki, Koji; Nagahira, Jyoji; Takahashi, Kazuyoshi; Yoshihara, Kunio; Matsui, Toshiro; and Ishikawa, Tadashi, 4,600,294, Cl. 355-14.00D.
Yoshikawa, Seiichi: *See—*
Isayama, Teruo; Takeuchi, Yukinobu; Ikeda, Yoshikazu; Kondo, Sigeuki; and Yoshikawa, Seiichi, 4,600,851, Cl. 310-324.000.
Yoshimura, Shohei; and Adachi, Akira, to Japan Styrene Paper Corporation. Core material for an automobile bumper. 4,600,636, Cl. 428-304.400.
Yoshino, Zenichi: *See—*
Higashi, Takehiro; Kobori, Michio; Yoshino, Zenichi; and Morimoto, Seiichi, 4,600,477, Cl. 203-26.000.
Yoshioka, Tadahiko: *See—*
Moroo, Akira; Tokunaga, Yoshiyasu; Suzuki, Takashi; and Yoshioka, Tadahiko, 4,600,313, Cl. 366-313.000.
Young, Gerald A.: *See—*
Kramer, Timothy A.; Young, Gerald A.; and Kock, Ronald W., 4,600,458, Cl. 156-199.000.
Young Industries, Incorporated, The: *See—*
Heyl, Robert D., 4,600,032, Cl. 137-315.000.
Ysohida, Jituo: *See—*
Ito, Katsumi; and Ysohida, Jituo, 4,600,999, Cl. 364-513.000.
Yu, Jing-peir: *See—*
Bromley, James E.; Chamberlin, John M.; and Yu, Jing-peir, 4,600,644, Cl. 428-399.000.
Yuda, Hideaki: *See—*
Tokutomi, Seijiro; Shindo, Osamu; and Yuda, Hideaki, 4,600,830, Cl. 250-201.000.
Zabrocki, Karl; Lindner, Christian; Muller, Friedmann; and Doring, Joachim, to Bayer Aktiengesellschaft. ABS-moulding compositions with improved flame resistance. 4,600,747, Cl. 525-83.000.
Zajechowski, Fred: *See—*
Fedora, Joseph; and Zajechowski, Fred, 4,599,818, Cl. 42-7.000.
Zarate, Robert A.: *See—*
Lutjens, Robert D.; and Zarate, Robert A., 4,599,868, Cl. 62-53.000.
Zbinden, Paul: *See—*
Ballenegger, Marc E.; and Zbinden, Paul, 4,600,709, Cl. 514-228.000.
Zdrok, Joseph Z.: *See—*
Maryyanek, Richard D.; and Zdrok, Joseph Z., 4,600,002, Cl. 128-206.190.
Zecher, Wilfried; and Reinking, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of aliphatic-aromatic poly-amide-imides in the absence of phenols. 4,600,729, Cl. 521-128.000.
Zeissler, Edward J.: *See—*
Holt, Ronald R.; Joseph, William A.; and Zeissler, Edward J., 4,601,004, Cl. 364-557.000.
Zelasko, F. Joseph. Spraying system utilizing a screw conveyor. 4,600,150, Cl. 239-126.000.
Zelczer, Alex. Zone control apparatus for central heating and/or cooling systems. 4,600,144, Cl. 236-46.00R.
Zemek, Thomas G., to United Technologies Corporation. Indexing method and apparatus. 4,600,359, Cl. 414-754.000.
Zenith Electronics Corporation: *See—*
Beaumont, Gregory J., 4,600,859, Cl. 315-3.000.
Chamberlain, William; and Weigand, John C., 4,600,947, Cl. 358-165.000.
Williams, Gregory A., 4,600,944, Cl. 358-154.000.
Zenith Radio Corporation: *See—*
Thomas, William L., 4,600,921, Cl. 340-825.310.
Zerfass, Hans-Rainer: *See—*
Lonne, Klaus; Majewski, Klaus-Peter; and Zerfass, Hans-Rainer, 4,600,201, Cl. 277-1.000.
Zibelin, Henry S. Mechanical heart. 4,600,405, Cl. 623-3.000.
Ziegler, Wolfgang; and Petermann, Hans, to Robert Bosch GmbH. Apparatus for illuminating passive liquid crystal displays (LCD's). 4,599,816, Cl. 40-544.000.
Zimmerman, James B. Dental tray rack. 4,600,251, Cl. 312-209.000.
Zimmerman, Sheldon B.: *See—*
Chaiet, Louis; Monaghan, Richard L.; Zimmerman, Sheldon B.; and Fernandez, Maria I. M., 4,600,691, Cl. 435-106.000.
Zink, Edmund S. Integrated photoscreen for making a halftone reproduction printing plate from a photograph. 4,600,666, Cl. 430-6.000.
Zmolek, Alfred J.: *See—*
Vitcenda, Marie A.; and Zmolek, Alfred J., 4,600,585, Cl. 426-2.000.
Zosi, Michael, to Grohe, Bernd. Connection of steering column to frame. 4,600,207, Cl. 280-279.000.
Zotos International Inc.: *See—*
Edman, Walter W.; and Klemm, Ernest J., 4,600,028, Cl. 132-7.000.
Zotto, Anthony A.: *See—*
Traver, Frank J.; Thimineur, Raymond J.; and Zotto, Anthony A., 4,600,436, Cl. 106-3.000.
Zuber, Thierry: *See—*
Brachet, Alain; Figuet, Jacques; Guidez, Joel; Lions, Noel; Traiteur, Rene ; and Zuber, Thierry, 4,600,554, Cl. 376-307.000.
Zucker, Stanley; and Schwarting, Fritz. Method of protecting a roadway maintenance and construction site. 4,600,178, Cl. 256-1.000.
Zymark Corporation: *See—*
Friswell, David R., 4,600,473, Cl. 159-47.100.
471199 Ontario Limited: *See—*
Reeve, Douglas W.; and Tran, Hoc N., 4,599,975, Cl. 122-379.000.
501 Dailey Petroleum Services Corporation: *See—*
Teng, Chuan C., 4,600,062, Cl. 175-322.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF JULY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AT&T Bell Laboratories: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., Re. 32,207, Cl. 427-85.000.

Australian Paper Manufacturers Limited: *See*—
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, Re. 32,203, Cl. 162-72.000.

Bracegirdle, Paul E. Process for making asphalt concrete. Re. 32,206, Cl. 366-7.000.

Carnt, Peter S.; and Schiess, George, to RCA Corporation. Television apparatus responsive to a transmitted color reference signal. Re. 32,209, Cl. 358-27.000.

Cody, John F.: *See*—
Cody, John M.; Weaks, William L.; and Cody, John F., Re. 32,202, Cl. 56-11.300.

Cody, John M.; Weaks, William L.; and Cody, John F. Centrifugal clutch and brake for lawn mower. Re. 32,202, Cl. 56-11.300.

Doddi, Namassivaya: *See*—
Mattei, Frank V.; Stephenson, Martin; Gordon, Allin K.; and Doddi, Namassivaya, Re. 32,208, Cl. 424-78.000.

Dresser Industries, Inc.: *See*—
Kimmel, Loren L., Re. 32,205, Cl. 266-243.000.

Ethicon, Inc.: *See*—
Mattei, Frank V.; Stephenson, Martin; Gordon, Allin K.; and Doddi, Namassivaya, Re. 32,208, Cl. 424-78.000.

Farrington, Alan: *See*—
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, Re. 32,203, Cl. 162-72.000.

Gordon, Allin K.: *See*—
Mattei, Frank V.; Stephenson, Martin; Gordon, Allin K.; and Doddi, Namassivaya, Re. 32,208, Cl. 424-78.000.

Halvorsen, Kenneth, to Mansfield Scientific, Inc. Electrode assembly for temporary pacing and heart measurements. Re. 32,204, Cl. 128-642.000.

Kimmel, Loren L., to Dresser Industries, Inc. Basic oxygen furnace construction. Re. 32,205, Cl. 266-243.000.

Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., to AT&T Bell Laboratories. Method for making integrated semiconductor circuit structure with formation of Ti or Ta silicide. Re. 32,207, Cl. 427-85.000.

Mansfield Scientific, Inc.: *See*—
Halvorsen, Kenneth, Re. 32,204, Cl. 128-642.000.

Mattei, Frank V.; Stephenson, Martin; Gordon, Allin K.; and Doddi, Namassivaya, to Ethicon, Inc. Absorbable hemostatic composition. Re. 32,208, Cl. 424-78.000.

Murarka, Shyam P.: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., Re. 32,207, Cl. 427-85.000.

Nelson, Peter F.: *See*—
Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, Re. 32,203, Cl. 162-72.000.

RCA Corporation: *See*—
Carnt, Peter S.; and Schiess, George, Re. 32,209, Cl. 358-27.000.

Schiess, George: *See*—
Carnt, Peter S.; and Schiess, George, Re. 32,209, Cl. 358-27.000.

Sinha, Ashok K.: *See*—
Levinstein, Hyman J.; Murarka, Shyam P.; and Sinha, Ashok K., Re. 32,207, Cl. 427-85.000.

Stephenson, Martin: *See*—
Mattei, Frank V.; Stephenson, Martin; Gordon, Allin K.; and Doddi, Namassivaya, Re. 32,208, Cl. 424-78.000.

Vanderhoek, Naphtali N.; Nelson, Peter F.; and Farrington, Alan, to Australian Paper Manufacturers Limited. Pulping with quinones and hydroquinones. Re. 32,203, Cl. 162-72.000.

Weaks, William L.: *See*—
Cody, John M.; Weaks, William L.; and Cody, John F., Re. 32,202, Cl. 56-11.300.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AMP Incorporated: *See*—
Cobaugh, Robert F.; and Coller, James R., B1 4,186,982, Cl. 339-17.00C.

Barber, Anthony C., to Imperial Metal Industries (Kynoch) Limited. Electrolytic processes and electrodes therefor. B1 3,905,828, 7-15-86, Cl. 429-218.000.

Bell Telephone Laboratories, Incorporated: *See*—
MacChesney, John B.; and O'Connor, Paul B., B1 4,217,027, Cl. 350-96.300.
MacChesney, John B.; and O'Connor, Paul B., B1 4,334,903, Cl. 65-3.120.

Betz Laboratories, Inc.: *See*—
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., B1 4,288,327, Cl. 210-698.000.

Chisarik, Andrew S.: *See*—
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., B1 4,288,327, Cl. 210-698.000.

Cobaugh, Robert F.; and Coller, James R., to AMP Incorporated. Contact with split portion for engagement with substrate. B1 4,186,982, 7-15-86, Cl. 339-17.00C.

Coller, James R.: *See*—
Cobaugh, Robert F.; and Coller, James R., B1 4,186,982, Cl. 339-17.00C.

Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., to Betz Laboratories, Inc. Copolymers for the control of the formation and deposition of materials in aqueous mediums. B1 4,288,327, 7-15-86, Cl. 210-698.000.

Imperial Metal Industries (Kynoch) Limited: *See*—
Barber, Anthony C., B1 3,905,828, Cl. 429-218.000.

MacChesney, John B.; and O'Connor, Paul B., to Bell Telephone Laboratories, Incorporated. Optical fiber fabrication and resulting product. B1 4,217,027, 7-15-86, Cl. 350-96.300.

MacChesney, John B.; and O'Connor, Paul B., to Bell Telephone Laboratories, Incorporated. Optical fiber fabrication. B1 4,334,903, 7-15-86, Cl. 65-3.120.

O'Connor, Paul B.: *See*—
MacChesney, John B.; and O'Connor, Paul B., B1 4,217,027, Cl. 350-96.300.
MacChesney, John B.; and O'Connor, Paul B., B1 4,334,903, Cl. 65-3.120.

Schuck, Joseph J.: *See*—
Godlewski, Irene T.; Schuck, Joseph J.; and Chisarik, Andrew S., B1 4,288,327, Cl. 210-698.000.

Weinar, Roger N. Walls and partitions and concealed fasteners for assembly thereof. B1 4,333,286, 7-15-86, Cl. 52-281.000.

LIST OF DESIGN PATENTEES

Abitibi-Price Corporation: *See*—
King, E. Mackey; and Mitchell, Bryant L., 284,689, Cl. D23-69.000.
Allars, Brian: *See*—
Edwards, David O.; and Allars, Brian, 284,663, Cl. D14-53.000.
American Home Products Corporation: *See*—
Ronayne, Walter M., 284,693, Cl. D23-150.000.
Amerine, James D., to O. M. Scott & Sons Company, The. Rotary spreader. 284,666, 7-15-86, Cl. D15-13.000.
Armijo, Joe E. Illuminable note pad and pen holder. 284,677, 7-15-86, Cl. D19-78.000.
Ashley, David C. Drafting instrument. 284,675, 7-15-86, Cl. D19-37.000.
Aulenti, Gae. Handle. 284,638, 7-15-86, Cl. D8-308.000.
Babl, Werner; and Mader, Ernst, to Metzeler Kautschuk GmbH. Tire. 284,648, 7-15-86, Cl. D12-140.000.
Baus, Heinz G. Massage shower. 284,688, 7-15-86, Cl. D23-57.000.
Bernault, Jean-Francois, to Salomon S.A. Cross-country ski boot. 284,613, 7-15-86, Cl. D2-276.000.
Bernault, Jean-Francois, to Salomon S.A. Cross-country ski boot. 284,614, 7-15-86, Cl. D2-276.000.
Black & Decker Inc.: *See*—
Somers, Robert I., 284,636, Cl. D8-21.000.
Bliskey, Dean A.; Lambert, Stephen K.; and Kearnes, Thomas, to Lambert Corporation. Combined walk behind seeder and fertilizer. 284,667, 7-15-86, Cl. D15-13.000.
Brefka, Paul E., to Briox Technologies, Inc. Infant apnea detector. 284,697, 7-15-86, Cl. D24-17.000.
Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, to Daimler Benz Aktiengesellschaft. Automobile. 284,644, 7-15-86, Cl. D12-92.000.
Briox Technologies, Inc.: *See*—
Brefka, Paul E., 284,697, Cl. D24-17.000.
British Telecommunications: *See*—
Edwards, David O.; and Allars, Brian, 284,663, Cl. D14-53.000.
Burchill, John F. Display stand for software discs or the like. 284,627, 7-15-86, Cl. D6-407.000.
Buyze, Allan W.: *See*—
Hackett, David E.; and Buyze, Allan W., 284,645, Cl. D12-98.000.
Calton, Dennis. Backpack cooler. 284,620, 7-15-86, Cl. D3-32.000.
Carson's, Inc.: *See*—
Culler, Randy R., 284,624, Cl. D6-371.000.
Culler, Randy R., 284,625, Cl. D6-381.000.
Castillo, James D. Leg brace. 284,702, 7-15-86, Cl. D24-64.000.
Citizen Watch Co., Ltd.: *See*—
Kabaya, Harumichi, 284,642, Cl. D10-38.000.
Clark, Richard H.; Swales, Barton L.; and Ege, Frank E., to Deere & Company. Planter row frame support. 284,669, 7-15-86, Cl. D15-33.000.
Cockburn, Paul A.: *See*—
White, Lynette R.; and Cockburn, Paul A., 284,661, Cl. D14-57.000.
Cowell, Robert L.: *See*—
Livesey, James R.; Tamura, Robert A.; and Cowell, Robert L., 284,679, Cl. D21-59.000.
Cubic Western Data: *See*—
Smith, Billy G., 284,705, Cl. D25-51.000.
Culler, Randy R., to Carson's, Inc. Chair. 284,624, 7-15-86, Cl. D6-371.000.
Culler, Randy R., to Carson's, Inc. Sofa or similar article. 284,625, 7-15-86, Cl. D6-381.000.
Daimler Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, 284,644, Cl. D12-92.000.
Davis, Myron F.; Jordan, Willis Y., III; Kraus, Walter F.; and Yeaw, Harold D., to International Business Machines Corporation. Personal Computer. 284,664, 7-15-86, Cl. D14-100.000.
Davis, William R.: *See*—
Doman, Donald W.; and Davis, William R., 284,687, Cl. D23-31.000.
Deenadayalu, R. Paul. Oropharyngeal tube with nares occluder. 284,701, 7-15-86, Cl. D24-62.000.
Deere & Company: *See*—
Clark, Richard H.; Swales, Barton L.; and Ege, Frank E., 284,669, Cl. D15-33.000.
Salley Gordon L.; and Wood, Mark W., 284,668, Cl. D15-33.000.
Degussa AG: *See*—
Pohlmann, Horst D., 284,692, Cl. D23-148.000.
Doman, Donald W.; and Davis, William R., to Kohler Co. Escutcheon for plumbing fitting. 284,687, 7-15-86, Cl. D23-31.000.
Dorelli, John. Toy tow truck. 284,682, 7-15-86, Cl. D21-139.000.
Drackett Company, The: *See*—
Jones, David A., 284,641, Cl. D9-341.000.
Durand, Philippe J. Bowl or similar article. 284,632, 7-15-86, Cl. D7-24.000.
Durbin, William H. Gun case for a revolver or the like. 284,622, 7-15-86, Cl. D3-38.000.
Edwards, David O.; and Allars, Brian, to British Telecommunications. Cordless handset telephone. 284,663, 7-15-86, Cl. D14-53.000.
Ege, Frank E.: *See*—
Clark, Richard H.; Swales, Barton L.; and Ege, Frank E., 284,669, Cl. D15-33.000.
Elliott, Claude, Jr.: *See*—
Molnar, Frank D.; and Elliott, Claude, Jr., 284,635, Cl. D8-14.000.
Engel, Herman J. Adapter base for electric lamp. 284,652, 7-15-86, Cl. D13-25.000.
Erickson, K. C.; and McGregor, Doug, to Pro-Mark, Inc. Extractor tool for plastic risers. 284,637, 7-15-86, Cl. D8-21.000.
Fabricant, Arlene, to Quaker Oats Company, The. Wrist-mounted toy lamb head. 284,683, 7-15-86, Cl. D21-148.000.
Fabricant, Arlene, to Quaker Oats Company, The. Wrist-mounted toy bear head. 284,684, 7-15-86, Cl. D21-159.000.
Fabricant, Arlene, to Quaker Oats Company, The. Wrist-mounted toy lion head. 284,685, 7-15-86, Cl. D21-163.000.
Fastaia, Anthony J.: *See*—
McKenzie, Robert H.; and Fastaia, Anthony J., 284,662, Cl. D14-59.000.
Ferdinand, Irwin J., to Hirsh Company. Shelf. 284,630, 7-15-86, Cl. D6-511.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Outsole. 284,616, 7-15-86, Cl. D2-320.000.
Gerch, Edward L., to Kingport, Ltd. Combined organizer tote and brief. 284,623, 7-15-86, Cl. D3-48.000.
Gillette Company, The: *See*—
Malm, Curtis L., 284,676, Cl. D19-51.000.
Gladczak, Robert J.: *See*—
Schroeder, Roger H.; Gladczak, Robert J.; and Hodlewsky, Wasyly G., 284,640, Cl. D8-499.000.
Glass Bulbs Limited: *See*—
Inns, David H., 284,631, Cl. D7-13.000.
Godden, Glenn S.; and Nelson, Michael D., to Self Regulation Systems, Inc. Biofeedback apparatus. 284,696, 7-15-86, Cl. D24-8.000.
Goergen, Rene: *See*—
Kwee, Henry T.; and Goergen, Rene, 284,649, Cl. D12-147.000.
Goodyear Tire & Rubber Company, The: *See*—
Kwee, Henry T.; and Goergen, Rene, 284,649, Cl. D12-147.000.
Gorman, Anthony G., to Racal Acoustics Limited. Helmet. 284,612, 7-15-86, Cl. D2-232.000.
Green, David T., to United States Surgical Corporation. Lateral anastomosis surgical stapler. 284,698, 7-15-86, Cl. D24-26.000.
Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 284,695, Cl. D24-1.100.
GT BMX Products, Inc.: *See*—
Turner, Gary, 284,646, Cl. D12-111.000.
Gustafsson, Bert. Combined tool and greenhouse. 284,703, 7-15-86, Cl. D25-15.000.
Hackett, David E.; and Buyze, Allan W. Mini truck. 284,645, 7-15-86, Cl. D12-98.000.
Hamami, Demir. Credenza. 284,629, 7-15-86, Cl. D6-445.000.
Hazlett, Nedra R. Telephone stand. 284,658, 7-15-86, Cl. D14-60.000.
Hirsh Company: *See*—
Ferdinand, Irwin J., 284,630, Cl. D6-511.000.
Hodlewsky, Wasyly G.: *See*—
Schroeder, Roger H.; Gladczak, Robert J.; and Hodlewsky, Wasyly G., 284,640, Cl. D8-499.000.
Hudson, Dannie B. Fishing troll weight. 284,686, 7-15-86, Cl. D22-145.000.
Ichikawa, Tohru: *See*—
Saito, Etsuro; Nemoto, Tsuneo; Ichikawa, Tohru; and Takahashi, Shinichiro, 284,665, Cl. D14-114.000.
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Stockdell, Daniel R. Training walker for an infant. 284,647, 7-15-86, Cl. D12-130.000.

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ISSUED JULY 15, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

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89 4,600,036
120 4,600,037
140 4,600,038

CLASS 139

434 4,600,039

CLASS 141

18 4,600,040
95 4,600,041
98 4,600,042

CLASS 144

193 A 4,600,043
372 4,600,044

CLASS 148

1.5 4,600,445
2 4,600,446
6.15 R 4,600,447
407 4,600,448
4,600,449

CLASS 149

19.3 4,600,450
4,600,451
4,600,452
36 4,600,453

CLASS 152

526 4,600,045

CLASS 156

55 4,600,454
64 4,600,455
117 4,600,456
158 4,600,457
199 4,600,458
212 4,600,459
235 4,600,460
244.12 4,600,461
278 4,600,462
345 4,600,463
4,600,464
351 4,600,465
391 4,600,466
394.1 4,600,467
440 4,600,468
636 4,600,469
644 4,600,470
646 4,600,471

CLASS 159

4.4 4,600,472
47.1 4,600,473
47.3 4,600,474

CLASS 162

72 Re.32,203
261 4,600,475

CLASS 164

34 4,600,046
453 4,600,047
463 4,600,048

CLASS 165

1 4,600,049
104.14 4,600,050
149 4,600,051
165 4,600,052
170 4,600,053

CLASS 166

75.1 4,600,054
115 4,600,055
291 4,600,056
295 4,600,057
382 4,600,058
385 4,600,059

CLASS 172

4 4,600,060

CLASS 174

15 CA 4,600,802
65 SS 4,600,803
84 C 4,600,804
102 R 4,600,805
121 A 4,600,806

CLASS 175

62 4,600,061

322 4,600,062
325 4,600,063
368 4,600,064

CLASS 177

123 4,600,065
211 4,600,066
4,600,067

CLASS 178

19 4,600,807

CLASS 179

2 DP 4,600,808
2 EA 4,600,809
16 AA 4,600,811
18 AD 4,600,812
18 BC 4,600,814
18 FC 4,600,813
170.2 4,600,815
175.3 R 4,600,810
190 4,600,816

CLASS 180

6.44 4,600,068
24.02 4,600,069
53.7 4,600,070
53.8 4,600,071
73.3 4,600,072
181 4,600,073
251 4,600,074
336 4,600,075

CLASS 181

233 4,600,076
242 4,600,077
286 4,600,078

CLASS 182

108 4,600,079
124 4,600,080
187 4,600,081
4,600,082

CLASS 187

7 4,600,083
9 E 4,600,084
24 4,600,085
27 4,600,086
29 R 4,600,087
4,600,088

CLASS 188

112 R 4,600,089
218 XL 4,600,090

CLASS 190

2 4,600,091

CLASS 191

12 C 4,600,817

CLASS 192

70.11 4,600,092

CLASS 193

35 A 4,600,093

CLASS 194

217 4,600,094

CLASS 198

346.2 4,600,095
505 4,600,096
731 4,600,097
773 4,600,098
774 4,600,099

CLASS 200

5 R 4,600,818
16 A 4,600,819
84 C 4,600,820

CLASS 202

84 4,600,476

CLASS 203

26 4,600,477

CLASS 204

14.1 4,600,479
20 4,600,480
59 R 4,600,478
67 4,600,481
129.4 4,600,482
130 4,600,483
157.74 4,600,484
181.7 4,600,485
182.3 4,600,486
182.4 4,600,487
192 N 4,600,488
192 R 4,600,489
298 4,600,490
4,600,492
300 EC 4,600,491
301 4,600,493
401 4,600,494
409 4,600,495

CLASS 206

315.6 4,600,100
330 4,600,116
422 4,600,101
457 4,600,102
505 4,600,103
604 4,600,104

CLASS 208

44 4,600,496
89 4,600,497
111 4,600,498
113 4,600,499
177 4,600,500
188 4,600,501
251 H 4,600,503
4,600,504
284 4,600,502

CLASS 209

9 4,600,505
310 4,600,506
587 4,600,105
662 4,600,106

CLASS 210

94 4,600,507
170 4,600,508
230 4,600,509
273 4,600,510
316 4,600,511
433.2 4,600,512
698 B1 4,288,327
712 4,600,513
751 4,600,514

CLASS 211

41 4,600,107
49.1 4,600,108
71 4,600,109
120 4,600,110

CLASS 215

6 4,600,111
274 4,600,112

CLASS 219

10.51 4,600,821
10.55 A 4,600,822
10.77 4,600,823
137.63 4,600,824
205 4,600,825
492 4,600,826
4,600,827

CLASS 220

1 T 4,600,113
85 B 4,600,114
327 4,600,115
366 4,600,117

CLASS 221

1 4,600,118
75 4,600,119
107 4,600,120
130 4,600,121
211 4,600,122

CLASS 222

3 4,600,123
54 4,600,124
81 4,600,125
82 4,600,126
83 4,600,127
108 4,600,128
175 4,600,129
209 4,600,130
478 4,600,131

CLASS 223

95 4,600,132

CLASS 224

232 4,600,133
260 4,600,134

CLASS 227

120 4,600,135

CLASS 228

45 4,600,136
102 4,600,137
179 4,600,138
184 4,600,139

CLASS 229

48 R 4,600,140
92.7 4,600,141
143 4,600,142

CLASS 232

17 4,600,143

CLASS 235

379 4,600,828
439 4,600,829

CLASS 236

46 R 4,600,144

CLASS 238

351 4,600,145

CLASS 239

6 4,600,146
14 4,600,147
29.3 4,600,148
120 4,600,149
126 4,600,150
400 4,600,151
542 4,600,152
543 4,600,153

CLASS 241

1 4,600,154
37.5 4,600,155
56 4,600,156
59 4,600,157
243 4,600,158
280 4,600,159
282.2 4,600,160

CLASS 242

55 4,600,161
55.2 4,600,162
96 4,600,163
107.6 4,600,164
118.4 4,600,165

CLASS 244

3.16 4,600,166
3.28 4,600,167
50 4,600,168
118.1 4,600,169
122 R 4,600,170
137 A 4,600,171
207 4,600,172

CLASS 248

68.1 4,600,173
72 4,600,174
122 4,600,175

CLASS 250

201 4,600,830
4,600,831
4,600,832
216 4,600,833
231 P 4,600,836
231 SE 4,600,834
4,600,835
235 4,600,837
270 4,600,838
310 4,600,839
338 4,600,840
548 4,600,841
577 4,600,842
578 4,600,843

CLASS 252

8.5 A 4,600,515
8.55 R 4,600,516
32.7 E 4,600,517
34 4,600,518
48.6 4,600,519
49.6 4,600,520
62.54 4,600,521
170 4,600,522
174.22 4,600,523
181 4,600,524
184 4,600,525
299.01 4,600,526
299.1 4,600,527
299.61 4,600,528
373 4,600,529
392 4,600,530

CLASS 254

134.3 FT 4,600,176
338 4,600,177

CLASS 256

1 4,600,178
67 4,600,179

CLASS 260

239.3 B 4,600,534
239.3 R 4,600,535
349 4,600,536
351.1 4,600,537
397.45 4,600,538
410.7 4,600,539
505 C 4,600,542
998.21 4,600,532

CLASS 261

79 A 4,600,544

CLASS 264

11 4,600,545
59 4,600,546
63 4,600,547
71 4,600,548
154 4,600,549
171 4,600,550

222 4,600,551
300 4,600,552

CLASS 266

51 4,600,180
102 4,600,181
243 Re.32,205
286 4,600,182

CLASS 269

43 4,600,183
303 4,600,184

CLASS 270

58 4,600,185

CLASS 271

182 4,600,186

CLASS 272

70 4,600,187
96 4,600,188
118 4,600,189
134 4,600,196
136 4,600,190

CLASS 273

54 B 4,600,191
67 A 4,600,192
72 A 4,600,193
73 G 4,600,194
81 A 4,600,195
143 R 4,600,197
148 R 4,600,198
153 S 4,600,199
313 4,600,200

CLASS 277

1 4,600,201
53 4,600,202
237 R 4,600,203

CLASS 280

33.99 A 4,600,204
95 R 4,600,205
231 4,600,206
279 4,600,207
289 A 4,600,208
400 4,600,209
408 4,600,210
603 4,600,211
611 4,600,212
618 4,600,213
624 4,600,214
707 4,600,215
772 4,600,216
808 4,600,217

CLASS 285

50 4,600,218
55 4,600,219
80 4,600,220
91 4,600,221
158 4,600,222
319 4,600,223
334 4,600,224
4,600,225

CLASS 292

264 4,600,226

CLASS 294

1.1 4,600,227
64.1 4,600,228
4,600,229
64.2 4,600,230
161 4,600,231

CLASS 296

3 4,600,232
24 R 4,600,233
97 K 4,600,234
106 4,600,235
190 4,600,236
223 4,600,237

CLASS 297

219 4,600,238
349 4,600,239
408 4,600,240
457 4,600,241

CLASS 299

7 4,600,242

CLASS 303

92 4,600,243
111 4,600,244
115 4,600,245

CLASS 305

54 4,600,246

CLASS 307

118 4,600,844
269 4,600,845
465 4,600,846
491 4,600,847

CLASS 310

54 4,600,848
103 4,600,849
242 4,600,850
313 B 4,600,852
4,600,853
324 4,600,851
331 4,600,854
338 4,600,855

CLASS 312

8 4,600,247
195 4,600,248
196 4,600,249
208 4,600,250
209 4,600,251
263 4,600,252
284 4,600,253
323 4,600,254
333 4,600,255

CLASS 313

25 4,600,856
35 4,600,857
413 4,600,858

CLASS 315

3 4,600,859
73 4,600,860
4,600,861
358 4,600,862

CLASS 318

114 4,600,863
254 4,600,864
274 4,600,865
313 4,600,866
341 4,600,867
567 4,600,868
568 4,600,869
610 4,600,870
653 4,600,871
658 4,600,872
701 4,600,873
798 4,600,874

CLASS 323

303 4,600,875
311 4,600,876
324 4,600,877

CLASS 324

51 4,600,878
58.5 A 4,600,879
71.1 4,600,880
74 4,600,881
202 4,600,882
207 4,600,883
236 4,600,884
244 4,600,885
301 4,600,886
333 4,600,887
439 4,600,888

CLASS 329

50 4,600,889
122 4,600,890

CLASS 330

10 4,600,891
144 4,600,892
252 4,600,893
287 4,600,894

CLASS 331

1 A 4,600,895
11 4,600,896
113 R 4,600,897
116 FE 4,600,898
116 R 4,600,899
4,600,900

CLASS 332

11 D 4,600,901

CLASS 333

14 4,600,902
173 4,600,904
177 4,600,903
196 4,600,905
205 4,600,906
246 4,600,907

CLASS 335

8 4,600,908
133 4,600,909
229 4,600,910

CLASS 336

212 4,600,911

CLASS 338

42 4,600,912

CLASS 339

17 C B1 4,186,982
17 M 4,600,256
40 4,600,257

99 R 4,600,258
4,600,259
111 4,600,260
116 C 4,600,261
147 R 4,600,262
177 R 4,600,263
247 4,600,264

CLASS 340

104 4,600,913
286 R 4,600,914
347 AD 4,600,916
347 DA 4,600,915
645 4,600,917
711 4,600,918
725 4,600,919
735 4,600,920
825.31 4,600,921
825.44 4,600,922
870.02 4,600,923

CLASS 343

5 SA 4,600,925
17.1 R 4,600,924
742 4,600,926

CLASS 346

1.1 4,600,927
4,600,928
134 4,600,929
140 R 4,600,931
201 4,600,930

CLASS 350

1.3 4,600,265
3.71 4,600,266
96.15 4,600,267
96.23 4,600,268
96.3 B1 4,217,027
98 4,600,269
162.17 4,600,270
174 4,600,271
287 4,600,272
336 4,600,273
339 F 4,600,274
418 4,600,275
432 4,600,276
561 4,600,277
587 4,600,278

CLASS 351

137 4,600,279

CLASS 352

37 4,600,280
50 4,600,281

CLASS 353

122 4,600,282

CLASS 354

66 4,600,283
82 4,600,284
212 4,600,285
4,600,286
299 4,600,287
435 4,600,288
448 4,600,289

CLASS 355

3 DD 4,600,290
3 R 4,600,291
3 SC 4,600,292
8 4,600,293
14 D 4,600,294
4,600,295
16 4,600,296
22 4,600,297
75 4,600,298

CLASS 356

5 4,600,299
23 4,600,300
28.5 4,600,301
39 4,600,302
73.1 4,600,303
138 4,600,304
152 4,600,305
317 4,600,306
346 4,600,307
363 4,600,308
401 4,600,309
432 4,600,310

CLASS 357

22 4,600,932
23.12 4,600,933
26 4,600,934
58 4,600,935
79 4,600,936

CLASS 358

21 R 4,600,937
27 Re.32,209
98 4,600,938
4,600,939
4,600,940

121 4,600,941
122 4,600,942
147 4,600,943
154 4,600,944
160 4,600,945
163 4,600,946
165 4,600,947
190 4,600,948
229 4,600,949
243 4,600,950
280 4,600,951

CLASS 360

10.3 4,600,952
4,600,953
67 4,600,954
99 4,600,955
106 4,600,956
120 4,600,957
123 4,600,958
137 4,600,959

CLASS 361

56 4,600,960
76 4,600,961
77 4,600,962
101 4,600,963
144 4,600,964
153 4,600,965
166 4,600,966
321 4,600,967
394 4,600,968
395 4,600,969
403 4,600,970
421 4,600,971

CLASS 362

20 4,600,972
32 4,600,973
102 4,600,974
147 4,600,975
277 4,600,976
362 4,600,977
365 4,600,978
373 4,600,979
385 4,600,980

CLASS 363

35 4,600,981
61 4,600,982
63 4,600,983
97 4,600,984

CLASS 364

169 4,600,985
200 4,600,986
4,600,987
4,600,988
4,600,989
4,600,990
4,600,991
4,600,992
431.05 4,600,993
484 4,600,994
491 4,600,995
4,600,996
505 4,600,997
507 4,600,998
513 4,600,999
4,601,000
518 4,601,001
4,601,002
4,601,003
521 4,601,021
557 4,601,004
602 4,601,005
726 4,601,006
784 4,601,007
900 4,601,008
4,601,009
4,601,010
4,601,011
4,601,012

CLASS 365

36 4,601,013
155 4,601,014
162 4,601,015
175 4,601,016
189 4,601,017
4,601,018
200 4,601,019
226 4,601,020

CLASS 366

7 Re.32,206
88 4,600,311
159 4,600,312
313 4,600,313

CLASS 367

14 4,601,022
65 4,601,023
86 4,601,024
125 4,601,025

CLASS 368

10 4,600,314
135 4,600,315
187 4,600,316

CLASS 369

38 4,601,026

CLASS 370

3 4,601,027
15 4,601,028
67 4,601,029
88 4,601,030

CLASS 371

10 4,601,031
23 4,601,032
25 4,601,033
4,601,034
32 4,601,035

CLASS 372

20 4,601,036
25 4,601,037
34 4,601,038
57 4,601,040
83 4,601,039

CLASS 373

72 4,601,041
93 4,601,042

CLASS 375

1 4,601,043
2.2 4,601,047
17 4,601,044
38 4,601,045
4,601,046
47 4,601,048

CLASS 376

292 4,600,553
307 4,600,554

CLASS 377

115 4,601,049

CLASS 378

18 4,601,050
118 4,601,051

CLASS 381

51 4,601,052

CLASS 382

1 4,601,053
4,601,054
49 4,601,055
50 4,601,056
51 4,601,057
52 4,601,058

CLASS 384

117 4,600,317
130 4,600,318

CLASS 400

54 4,600,319
122 4,600,320
124 4,600,321
4,600,322
4,600,323
144.1 4,600,324
208 4,600,325
691 4,600,326

CLASS 401

18 4,600,327
129 4,600,328

CLASS 402

74 4,600,329

CLASS 403

23 4,600,330
165 4,600,331
179 4,600,332
259 4,600,333
369 4,600,334

CLASS 404

6 4,600,335
35 4,600,336
4,600,337

CLASS 405

74 4,600,338
211 4,600,339
297 4,600,340

CLASS 407

99 4,600,341

CLASS 409

227 4,600,342

CLASS 411

303 4,600,343
435 4,600,344
447 4,600,345

CLASS 412

3 4,600,346

CLASS 413

26 4,600,347

CLASS 414

11 4,600,348
225 4,600,349
267 4,600,350
331 4,600,351
463 4,600,352
563 4,600,353
607 4,600,354
680 4,600,355
694 4,600,356
730 4,600,357
749 4,600,358
754 4,600,359

CLASS 415

2 A 4,600,360
146 4,600,361

CLASS 416

208 4,600,362

CLASS 417

187 4,600,363
216 4,600,364
246 4,600,365
319 4,600,366
360 4,600,367
378 4,600,368

CLASS 418

55 4,600,369

CLASS 419

5 4,600,555

CLASS 420

542 4,600,556

CLASS 422

4 4,600,557
7 4,600,558
41 4,600,560
89 4,600,559
170 4,600,561
180 4,600,562
186.29 4,600,563
249 4,600,564

CLASS 423

50 4,600,565
179.5 4,600,566
242 4,600,567
4,600,568
243 4,600,569
244 4,600,570
363 4,600,571
447.2 4,600,572

CLASS 424

10 4,600,573
20 4,600,577
28 4,600,574
45 4,600,575
49 4,600,576
78 Re.32,208
4,600,578
80 4,600,579
84 4,600,581
91 4,600,582
4,600,583
94 4,600,580
128 4,600,584

CLASS 425

38 4,600,370
110 4,600,371
128 4,600,372
144 4,600,373
149 4,600,374
174.4 4,600,375
346 4,600,376

CLASS 426

2 4,600,585
4,600,586
19 4,600,587
42 4,600,588
56 4,600,589
69 4,600,590
94 4,600,591
112 4,600,592
438 4,600,593
443 4,600,594
501 4,600,595
523 4,600,596

CLASS 427

9 4,600,597
27 4,600,598
34 4,600,599
85 Re.32,207
89 4,600,600
96 4,600,601
4,600,602
180 4,600,603
216 4,600,604
379 4,600,605
389 4,600,606
421 4,600,607
424 4,600,608
438 4,600,609

CLASS 428

2 4,600,610
13 4,600,611
23 4,600,612
35 4,600,613
4,600,614
36 4,600,615
4,600,616
64 4,600,617
92 4,600,618
118 4,600,619
121 4,600,621
135 4,600,622
151 4,600,623
161 4,600,624
167 4,600,625
193 4,600,626
195 4,600,620
201 4,600,629
203 4,600,627
4,600,630
212 4,600,631
216 4,600,628
220 4,600,632
4,600,633
4,600,634
4,600,635
304.4 4,600,636
318.4 4,600,637
323 4,600,638
327 4,600,639
332 4,600,640
355 4,600,641
367 4,600,642
375 4,600,643
399 4,600,644
403 4,600,645
405 4,600,646
412 4,600,647
4,600,648
4,600,649
413 4,600,650
422 4,600,651
423.3 4,600,652
425.6 4,600,653
432 4,600,654
437 4,600,655
446 4,600,656
447 4,600,657
450 4,600,658
471 4,600,659
607 4,600,660
614 4,600,661
624 4,600,662
632 4,600,663

CLASS 429

7 4,600,664
120 4,600,665
218 B1 3,905,828

CLASS 430

6 4,600,666
22 4,600,667
31 4,600,668
47 4,600,669
57 4,600,670
4,600,671
64 4,600,672
66 4,600,673
72 4,600,674
106.6 4,600,675
4,600,676
108 4,600,677
138 4,600,678
162 4,600,679
207 4,600,680
242 4,600,681
270 4,600,682
4,600,683
296 4,600,684
313 4,600,685
326 4,600,686
529 4,600,687
558 4,600,688

CLASS 431

351 4,600,377

CLASS 432

8 4,600,378
13 4,600,379
58 4,600,380

CLASS 433

4 4,600,381
5 4,600,382
9 4,600,383
29 4,600,384
60 4,600,385
4,600,386
136 4,600,387
176 4,600,388
217.1 4,600,389
218 4,600,390
220 4,600,391
225 4,600,392

CLASS 434

88 4,600,393

CLASS 435

7 4,600,690
25 4,600,689
106 4,600,691
108 4,600,692
176 4,600,693
312 4,600,694

CLASS 436

2 4,600,695
63 4,600,696
174 4,600,697
534 4,600,698

CLASS 440

38 4,600,394
61 4,600,395
77 4,600,396

CLASS 445

6 4,600,397

CLASS 446

240 4,600,398
242 4,600,399

CLASS 455

54 4,601,059
192 4,601,060
208 4,601,061
285 4,601,062
317 4,601,063
608 4,601,064

CLASS 474

166 4,600,400

CLASS 502

24 4,600,699
50 4,600,700
159 4,600,701
200 4,600,702
210 4,600,703
318 4,600,704

CLASS 514

15 4,600,705
23 4,600,711
31 4,600,706
46 4,600,707
78 4,600,708
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CLASS 518

701 4,600,726

CLASS 521

82 4,600,727
84.1 4,600,728
128 4,600,729
167 4,600,730

CLASS 523

109 4,600,731
138 4,600,732
144 4,600,733
179 4,600,734
216 4,600,735
351 4,600,736
414 4,600,737
500 4,600,738

CLASS 524

48 4,600,739
120 4,600,740
139 4,600,741
166 4,600,742
377 4,600,743
446 4,600,744
534 4,600,745

CLASS 525

57 4,600,746
83 4,600,747
133 4,600,748
314 4,600,749
398 4,600,750
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439 4,600,753
531 4,600,754

CLASS 526

81 4,600,755
134 4,600,756
142 4,600,757
207 4,600,759
262 4,600,760
270 4,600,761
348.6 4,600,762

CLASS 528

111 4,600,763
128 4,600,764
193 4,600,765
207 4,600,766
252 4,600,767
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CLASS 530

356 4,600,533
385 4,600,531

CLASS 536

22 4,600,771

CLASS 544

30 4,600,773
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198 4,600,776
625 4,600,772

CLASS 546

164 4,600,777
200 4,600,758
249 4,600,778

CLASS 548

135 4,600,779
193 4,600,780
201 4,600,781
216 4,600,782
501 4,600,783

CLASS 549

39 4,600,784
212 4,600,785
263 4,600,786
362 4,600,787
403 4,600,788

CLASS 556

17 4,600,789
421 4,600,790

CLASS 558

80 4,600,791
133 4,600,543
255 4,600,540
321 4,600,541

CLASS 560

12 4,600,792
25 4,600,793

CLASS 562

567 4,600,794
599 4,600,795

CLASS 564

159 4,600,796
414 4,600,797

CLASS 568

636 4,600,798
772 4,600,799
832 4,600,800

CLASS 604

65 4,600,401
96 4,600,402
115 4,600,403
387 4,600,404

CLASS 623

3 4,600,405

CLASSIFICATION OF DESIGNS

D2—	232	284,612		429	284,628		92	284,644			284,663		51	284,676		148	284,692
	276	284,613		445	284,629		98	284,645		57	284,661		78	284,677		150	284,693
		284,614		511	284,630		111	284,646		59	284,662		88	284,678		163	284,694
	277	284,615	D7—	13	284,631		130	284,647		60	284,658	D21—	59	284,679	D24—	1.1	284,695
	320	284,616		24	284,632		140	284,648		100	284,664		128	284,680		8	284,696
	405	284,617		379	284,633		147	284,649		114	284,665		130	284,681		17	284,697
D3—	5	284,618		395	284,634			284,650	D15—	13	284,666		139	284,682		26	284,698
	20	284,619	D8—	14	284,635		187	284,651			284,667		148	284,683		29	284,699
	32	284,620		21	284,636	D13—	25	284,652		33	284,668		159	284,684		32	284,700
	35	284,621			284,637			284,653			284,669		163	284,685		62	284,701
	38	284,622		308	284,638	D14—	11	284,654		69	284,670	D22—	145	284,686		64	284,702
	48	284,623		331	284,639		53	284,655	D18—	1	284,671	D23—	31	284,687	D25—	15	284,703
D6—	371	284,624		499	284,640			284,656			284,672		57	284,688		50	284,704
	381	284,625	D9—	341	284,641			284,657		12	284,673		69	284,689		51	284,705
	383	284,626	D10—	38	284,642			284,659		14	284,674			284,690		80	284,706
	407	284,627	D12—	16	284,643			284,660	D19—	37	284,675		92	284,691	D26—	37	284,707

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P.—	25	5,764		70	5,765		5,766		71	5,767

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48 : 284,678
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